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SENATOR GALLINGER'S REPLY

Senator Gallinger, chairman of the Merchant Marine Commission, which made a tour of the country last year to inquire into the state of American shipping in the foreign trade has issued a statement defining the reasons why the commission after its inquiry did not see fit to recommend discriminating duties. The subject was raised in the United States senate by Senator Bailey and considerable discussion followed. Senator Gallinger's statement is as follows:

"When the Merchant Marine Commission of five senators and five representatives was appointed on April 28, 1904, it is probable that a majority of those members of the commission who had positive views as to the best method of reviving the merchant marine favored a return to the historic policy of discriminating duties," said the senator. "The hearings in the ports of the North and South Atlantic, the great lakes, the Pacific, and the Gulf of Mexico, disclosed a very strong sentiment for the discriminating duty plan, and also a considerable sentiment for some carefully guarded and equitable form of subsidy or subvention. Between these two plans the testimony of what may perhaps be called the 'interested parties'—that is, the practical ship owners and ship builders with close personal knowledge of ocean trade—seemed to be rather evenly divided.

"When the commission assembled in Washington to prepare its report to congress it discussed, first, the thirty commercial treaties with foreign governments which forbid discrimination in customs duties or tonnage duties. As these treaties form the groundwork of our modern commercial relations, it seemed to be the prevalent judgment of the commission that to abrogate them and then to induce foreign governments to renew them on as good terms as before would be a formidable undertaking. However, this was not regarded as absolutely impossible.

"Next, the commission considered the element of retaliation by foreign governments if we were to discriminate in favor of our shipping. It seemed to be the general opinion that such retaliation would be directed not against American shipping alone, but against American export trade in general, wherever it could be most seriously affected. In this connection the chairman of the commission presented an important remonstrance against discriminating duties, which had been received from commercial associations of the Central West.

"Next in order the commission considered the relation of a discriminating duty policy to the tariff, in view of the fact that 43 per cent in value and 60 or 70 per cent in bulk of our imports were on the free list in the fiscal year 1903. Such important food articles as tea, coffee, cocoa, spices, and such important crude materials as rubber, jute, and many other fibers, and great quantities of drugs and chemicals that enter into domestic manufacturing, are and long have been free of all customs duties in the ports of the United States. As the commission looked into this question it became manifest that in order to give broad and effective encouragement to our ocean shipping through discriminating duties the free list would have to be abolished.

"For it was discovered on analysis that no less than 98 per cent of our imports from Brazil; 96 per cent of those from Chile; 81 per cent from Colombia; 80 per cent from Venezuela; 82 per cent from Ecuador, and 77 per cent from Bolivia and Paraguay are non-dutiable, moreover, 64 per cent of our imports from Japan, 50 per cent of our imports from China, and 69 per cent of our imports from India are non-dutiable.

"On the other hand, it is true that only 28 per cent of our imports from Europe and only 17 per cent of our imports from the West Indies are non-dutiable. To the trade with Europe, conveyed largely in relatively fast, high-cost vessels, and to the trade with the West Indies discriminating duties could, undoubtedly, be applied with benefit to American shipping, even though the free list were not reduced. But a bill to encourage American shipping, which gave such encouragement chiefly to ships running to Europe, and the West Indies, and not to ships running to South America and Asia, would, plainly, never meet with the approval of the American people.

"When the issue came up in concrete form not one member of the commission was willing to abolish the free list, or even to reduce it temporarily in order to make discriminating duties effective for the restoration of American shipping. A relatively small duty on those articles now free, if imported in foreign ships, would suffice to give American ships the preference. But all the American ships now in existence that are registered for and engaged in foreign trade are able to carry now only 10 per cent of our total imports and exports.

"For several years, therefore, until enough new ships could be built, the imposition of even a low duty on free goods, if imported in foreign vessels, would mean the actual collection of such a duty on these goods, or most of them—there not being enough American vessels to bring them in free. These free articles, as a rule, are articles the like of which is not produced in the United States. That is, they are non-competitive products peculiar to the tropics. The imposition of a duty, even a small duty, on them would, therefore, almost inevitably lead to an increase in price, which would be likely to be resented by American consumers.

"Here is the most powerful reason why the discriminating

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duty policy has not been recommended to congress by the Merchant Marine Commission, a probable majority of whose members preferred this policy when they were appointed and preferred it until they had given eight months of earnest and impartial study to the question and become convinced that to make discriminating duties honestly effective for the encouragement of American shipping where American shipping is most needed the free list would have to be eliminated.

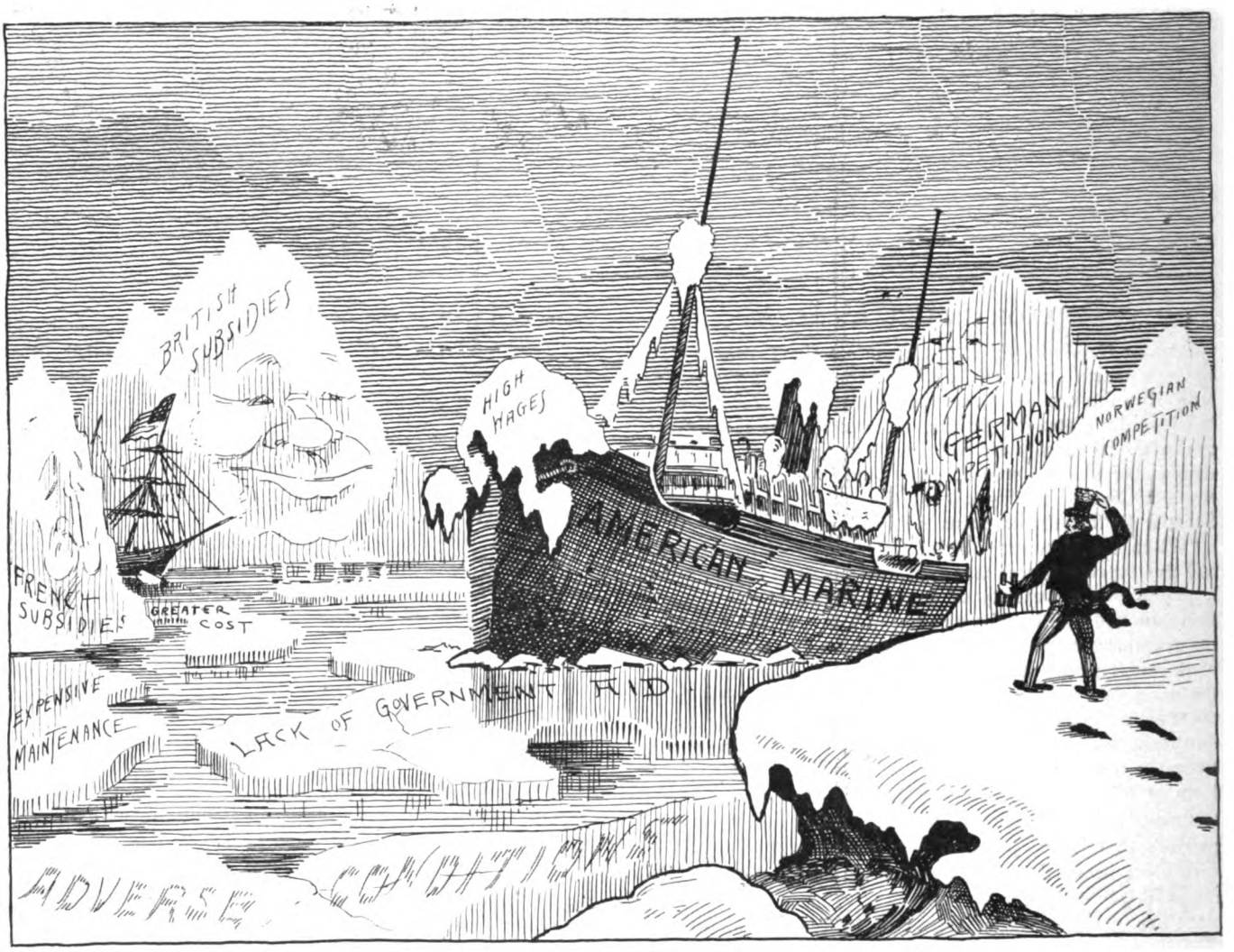
"Those three members of the commission who sign the minority report and recommend discriminating duties as a substitute for sections two, three and four of the commission bill, are no more in favor of abolishing the free list than are the majority. They say, frankly:

"But we are not willing, nor do we think it necessary, to commit ourselves to the proposition that anything now upon the 'free list' should be made 'dutiable.' We prefer to take the chances of aiding our merchant marine by discriminating duties upon the 60 per cent of imports now on the 'dutiable' list.

"The dutiable list in the fiscal year 1903 included 57 per cent in value of the entire imports. But it happens that most articles on the free list are very bulky—being chiefly foods and crude materials, and that they represent 60 to 70 per cent in sheer bulk of our imports. A freight ship needs bulk, as well as value of cargo, to utilize her space to the best advantage, and make her most seaworthy.

"It is an important fact, therefore, as bearing on this problem of the mercantile marine, that only from 30 to 35 per cent of the total bulk of our imports are available to give encouragement to American ships, in case the policy is applied only to dutiable goods, and not to the enormous quantity of merchandise now on the free list.

"This means, in effect, that the discriminating duty policy would encourage only one ton out of every three tons of American shipping engaged in foreign trade, or only one ship out of every three ships, on the basis of actual bulk of cargo carried. On the other hand, the plan of the majority of the commission would apply equitably to every ship that employed its quota of naval volunteers and complied with the other government requirements."



THE BLOCKING OF NAVIGATION.

Congressional inaction does on the ocean what Nature does on the lakes.

Forty-two years from the time when her frame was prepared and taken to Portland by the United States government, the schooner Mary L. Newall arrived in Boston last week. In 1862 the government gave orders for several fine warships and the timber for one of these vessels was sent to Portland where construction was to begin. The advent of the Merrimac, however, showed the folly of wooden warships and work was stopped upon the vessel. As no one would buy the partially completed ship the frame was sunk in Portland harbor where it remained until two years ago. It was live oak timber and was found to be in a complete state of preservation and Elmer S. Crosby of Bath, Me., built the Mary L. Newell out of it and launched her last month. She is 228 ft. long, 40 ft. 2 in. beam and 21 ft. 6 in. deep.

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SUPREMACY OF THE BATTLESHIP

The naval vessels to be derived from the war in the far east has caused the navy department to issue a statement setting forth the manner in which the war has demonstrated the supremacy of the battleships and minimized that of the torpedo boat and torpedo boat destroyer. The war has given to the armored cruisers little opportunity to prove their efficiency. Following is the statement as issued by the navy department:

The present war in the far east has in its many sidedness given pause to many whose vocation and tastes lead them to ponder questions of military policy and strategy. The conduct of the Japanese armies has won world wide admiration, equalled only perhaps by that aroused by the heroic resistance of the Russian garrison at Port Arthur. A still greater surprise perhaps has been caused by the superb condition and efficiency of the Japanese fleet, ascendancy upon the seas being supposedly a less natural development of their old-time war spirit than a fighting supremacy on shore. Every type of war vessel has its place in the navy of that country, and it is not too much to say that each has been used in the manner and for the purposes to which it is best adapted and for which it was intended; and perhaps no more useful book is opened to the modern tactician than a thorough and logical study of the employment of the different weapons. In such a study sound conclusions may differ surprisingly from hasty conceptions.

To neutralize something powerful and costly by means of an inferior and cheap agent has always been an attractive theme; but seldom if ever have the ends attained justified the brilliant expectations of those who have allowed their imaginations to run riot. In 1805, William Pitt, upon examining the plans of Fulton's torpedo boat, remarked that if that mode of fighting were adopted it would be the end of military navies; and yet a hundred years have passed and the battleship still stands supreme. During these generations the French, despairing of opposing equal force to the British fleets, had adopted the policy of employing swift cruisers for commerce destroying, and they actually did capture a great many merchant ships of their hereditary enemy; but the injury was confined to the feelings of the many and the pockets of the few; supremacy on the sea and mastery of the situation remained with the nation whose naval line-of-battle stood unbroken. In the early days of the modern development of the torpedo boat, the fascinating idea again came to the front of using those vicious little craft to annihilate fleets; the imaginary contest was likened to that of the microbe attacking the elephant, but the revulsion has not come; experience gradually caused it to be seen that the laws of nature remain the same, and that a small and frail cockleshell cannot maintain either speed or even existence at sea in the same manner as a heavy ship; the results of the present war in the east appear to demonstrate that not only is the availability of a torpedo boat at the front dependent upon having a supporting ship and convenient base and refuge, but that prospect of success is greatly enhanced by the presence of a containing force to restrain the enemy and keep him in a situation favorable to the attack. It has been suggested that even the dormant mine has in this war been so successful as to almost enter the category of offensive weapons and thus still farther discountenance the battleship; in its important though somewhat accidental results the mine may be likened to a small chemical bomb which will surely prostrate the strongest man in his carelessness, but which can surely not do a man's work in the world.

Ships must not touch mines, and must protect themselves against the torpedo; but their power in bringing war to a successful issue never has been stayed except by a greater force of a similar nature. And an examination of the results of the various modes of attack brings out the additional evidence of this war as indicating the probable immutability of that governing principle.

In the brusque inauguration of hostilities by the Japanese torpedo boat flotilla at Port Arthur, during the night of Feb. 9, they did undoubtedly deliver a telling blow by disabling three Russian battleships. The temporary crippling of that force affected the conduct of operations not only during the beginning but throughout the entire first phase of the war; the Japanese, having by that stroke won the mastery of the sea, were able to land troops at the Yalu and later at Niuchwang instead of at the far south end of the Korean Peninsula. This mastery was due to their having the preponderating force of battleships which alone enabled them to blockade the Russian fleet. No more eloquent tribute to the preeminent value of battleships is to be found than this one circumstance that the small margin of superiority thus obtained saved the army hundreds of miles of precarious and weary land transport of men and supplies, enabling them to strike swiftly, hard and continuously upon a weaker enemy before he could be reinforced.

On the other hand if, under normal conditions, battleships can be destroyed or seriously damaged by unsupported torpedo boats, their value is seriously compromised. This, however, does not appear to be the case. The action of Feb. 9 was a surprise far excelling the usual elements of a surprise attack; the Russian fleet, fourteen vessels in all, were anchored close together in the outer funnel-shaped roadstead, without suspicion of impending hostilities, not a patrol boat being out, and the crews peacefully sleeping in their usual berths; three Japanese destroyer flotillas (twelve vessels) approached with lights burning, and, being mistaken (as intended) for Russian boats returning, were allowed to approach close to the huddled fleet; then, with a smooth sea, at close range, hardly disturbed by a single shot in return or flash of searchlight, with all the conditions of easy target practice, not less than twenty-four torpedoes (and probably more) were discharged of which three took effect. The results were undoubtedly momentous; but it would be a hardy logician who could deduce from that incident the comforting thought that the little torpedo craft has displaced the battleship or even materially diminished its prestige. As is well known to all who have followed in the press the procession of events, Admiral Togo's fleet left Japan at the time the message was sent recalling the minister at St. Petersburg, established a naval base in the islands neighboring to Port Arthur, and thenceforth with his battleships and large cruisers invested that port and supported his small craft in their constant attacks; protected from torpedo attack by his own torpedo flotillas, he blockaded the Russian fleet and immobilized their battleships. Although the Russian destroyers in Port Arthur numbered twenty-four, or eight more than all in the United States navy, not one has scored a hit so far during the war.

Scores of other torpedo attacks have been delivered by the Japanese, but nearly all met with complete lack of success, although made as usual under the cover of darkness and against an enemy at anchor and whose position was known. Upon one occasion, after a soul-stirring night, that of June 23, the Russian ships being in the outer roadstead, twelve torpedoes were picked up in the morning having missed their marks and having their mechanism apparently set to float at the end of the run (instead of to sink as is customary) in the evident hope that they might find a target while drifting about. How many others were sped during that strenuous night, and sank or drifted away in the tide, will probably never be known. In a few other cases hits were scored which laid the victims up for a few days after which they returned to service. But the fact remains that not a Russian has been sunk by a torpedo until just recently, when the Sevastopol succumbed to the incessant attacks, she being "contained" by the Japanese battle fleet and compelled to lie helplessly an-

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chored outside of the harbor, entirely exposed, and with many of her guns landed to aid in the shore defenses. The circumstances were indeed peculiar. The fleet in Port Arthur had been destroyed by gun fire, the Japanese having occupied a hill which allowed them to deliver a direct fire on it with siege and naval guns. The Sevastopol was moved to the outer roadstead, and, hemmed in by Togo's battleships, anchored under the Tigers' Tail forts, protecting herself by a boom defense and nets of other vessels lost. This defense withstood continuous night attacks by Japanese destroyers and torpedo boats for ten days, when she was finally struck by three torpedoes and is now beached on the rocks under Golden Hill forts. She was a stationary target day and night for two weeks and it is not known how many attacks were delivered against her, but a probably low estimate of the number of torpedoes fired would be 150. The Japanese suffered severely in the attacks and lost two destroyers and some of the smaller torpedo boats. The weather, while severe upon the boats' crews, was evidently favorable for torpedo work, as the reports refer to snow, rain, sleet and the elements generally being bad.

Day attacks by torpedo boats have never been regarded as worth attempting. Several incidents of this war have been illustrative of their impotence in day light. The first was when the Varyag came out of Chemulpo to face the Japanese squadron; not a single torpedo boat was permitted to enter the field of action. Again, during and following the fleet action of Aug. 10, although there were present eight Russian destroyers and at least fifteen Japanese destroyers and many torpedo boats, not a torpedo reached its mark—if indeed any were discharged; none dared to approach within torpedo range by daylight. The same is true of the action of Aug. 14 between the Vladivostok armored cruisers and Admiral Kamimura's fleet; the ill-fated Rurik was crushed by gun fire alone, and the torpedo boats effected nothing against the Rossia and Gromoboi which escaped to Vladivostok although badly damaged by gun fire. So far as actions on the open sea are concerned, it may be said that in none have the results been influenced in any way by the presence of the torpedo boat or the torpedo boat destroyer.

Somewhat to the chagrin of students of the game of naval warfare, this war has afforded no field for the discussion of cruisers. The armored cruisers of the two fleets have simply been mutually pitted one against the other; "protected" cruisers, whose sole sphere in military operations has of late years been admitted to be restricted to extended sea scouting, have been barred from that service by the localized character of the operations, the smaller craft with their wireless telegraph systems being on constant sentry duty off Port Arthur and notifying Admiral Togo of any threatened sortie. Vessels of all types were present in both fleet actions, but the attention of both sides appears to have been devoted exclusively to crippling each other's battleships. Nor have there been any individual, actions between unarmored ships, other than the destruction of the gallant liner Novik by the Chitose and Tsushima. The Varyag, upon issuing from Chemulpo, was of course immediately crushed by the overwhelming force confronting her. The other Russian cruisers were of occasional assistance in driving off the enemy's torpedo boats or rescuing their own; but rarely has the name of any such vessel caused occasion for mention in either official or press reports.

The overshadowing importance of the battleship is nowhere more appreciated than in Japan. Had they had at the outset twelve, or even ten, battleships instead of six, the Russian fleet would have been destroyed on Aug. 10—the supreme incentive to holding out at Port Arthur being thus removed, that fortress would probably have fallen, the war correspondingly advanced and thousands of lives and millions of treasure saved. Threatened now by the Russian second Pacific fleet, it is safe to say that they would gladly recover at several times their cost the Hatsuse and the Yashima (if so be it that the uncontradicted reports of the latter's loss be true); for well do they know that the loss of the command of the sea would mean the end of the campaign in Manchuria. Likewise gladly would the Russians buy back the Petropavlovsk, sunk in the same manner as the two Japanese—by mines skilfully planted by the enemy.

In summing up the lessons of the war, one cannot do so more accurately or felicitously than was done by Lord Selborne, first lord of the British admiralty, in the following words:

"The lessons from the war in the far east are the importance of the personnel, the necessity for having a margin of strength, and the fact that without battleships no power can hold or win command of the sea."

HIGHER GRADE FOR SHIP'S ENGINEERS

The Hamburg-American Line and the North German Lloyd of Bremen, considering it desirable, in view of the increasingly complicated nature and great cost of ships' engines, and particularly of those of their large express steamers that superintending engineers should possess a greater proficiency than is at present required of a first engineer by the German regulations, are stated to have recently proposed to the Imperial government to establish two higher grades of ships' engineers than exist at present, and to have suggested that these higher grade engineers should have to submit to more stringent state examinations, and should then rank above the present first engineers. It appears, however, that in consequence of the opposition of other ship owners in Germany, the government has not accepted this proposal. The majority of ship owners state that they do not wish for further government interference in their arrangements, and that those steamship companies which consider it desirable that their engineers should acquire greater proficiency for the work with which they are to be entrusted, can easily make their own conditions before engaging them, and could for instance insist upon every first engineer in their service attending the engineering course of the Prussian State Technical College for the purpose of acquiring further knowledge of machinery, etc.

The Hamburg-American Line now owns 125 ocean-going steamers, of which six are so-called "express" steamers of great speed, and two are, "tourist" steamers, specially fitted up for this purpose with almost every imaginable convenience. The company now maintains forty-seven lines and branch lines in various parts of the world; several of the same being carried on in conjunction with other German steamship companies. Amongst these latter are a line established last year between New York and the Levant in conjunction with the Hamburg-Levant Line (which, however, is stated to have so far been unprofitable), and a line between New York and Genoa, carried on together with the North German Lloyd. On the other hand, the Hamburg-American Line withdrew in 1903 from the arrangement concluded about five years ago with the North German Lloyd concerning a joint fortnightly mail service between Germany and the Far East (according to which the additional subsidy of 75,000 l. granted by the German government for this service in 1898 was divided between the two companies). The Hamburg-American Line, it may here be observed, now receives no state subsidy whatever for any of its services, the annual amount paid by the German post office for the carriage of the mails between Hamburg and the United States of America not being a subsidy.

The Shipping Federation of Canada is raising objection to the two-story plan of improvements at the Montreal wharf on the ground that the added handling of freight delivered by lake boats in transferring to ocean liners would make shipping by way of that port too expensive. Alterations in the plans will probably be made.

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THE ACCIDENT ON THE MASSACHUSETTS

Following is an extract from the report of the board which was detailed to inquire into the accident on board the battleship Massachusetts, where several men were scalded to death by the bursting of a gasket:

"Fires had been started in this boiler on the morning of the accident and steam had formed about 9:30. The pressure had reached about 75 to 80 lbs. and was being gradually raised to the working one. Without warning, at the time stated, a portion of the manhole gasket gave way under the existing pressure and the escaping steam and hot water filled the fireroom almost immediately. Anderson and Wilson reached the alleyway through the compartment door, but were scalded while passing through the stream of steam and water. Bramluett escaped up the straight ladder nearly in line with this stream and was uninjured. The others in the compartment were evidently confused and blinded by the steam and rushed to the outboard end of the fireroom where they partly opened a door to a coal bunker which was full of coal. Doran partly pushed his head through this opening into the coal and, though nearly suffocated, remained there, he believes, about forty minutes. He then shouted, asking where the door was and if it was open. Receiving an affirmative reply, he rushed in that direction, started first to go behind the door, but was caught by those outside and pulled into the alleyway. He was unhurt until his attempt to leave the compartment and was badly scalded in passing out. Bub was removed soon after, but was in a dying condition. Hamilton and Ritzel were found dead from universal scalding and asphyxia. Lieut. W. C. Cole, U. S. N., the senior officer of the engineering department of the Massachusetts, received a lacerated wound of the forehead and superficial scald of the greater portion of his back and of right side of face and neck in a gallant attempt to rescue anyone who might be alive within the fireroom.

"The safety valve was immediately opened; the fires were hauled in the opposite (forward) end of the boiler, and the feed pumps were started as soon as they could be reached. It is believed that the boiler is uninjured. A careful examination of the manhole plate, mask and gasket, and the evidence given to the board does not indicate that there was, prior to the accident, any known or suspected unsafe condition in this connection. The bottom manholes of these boilers have been reinforced, but owing to the plan of the same this could not properly be done with the wing manholes. For this reason a mask is used over the latter for strengthening and securing the manhole plates and this renders the exact centering of the plate more difficult. The portion of the gasket that blew out is but little broken and does not indicate that it was defective. It was a new, black Brandt gasket and had never been used under steam pressure previously, but was in place during the hydrostatic test of the boiler.

"The inner surface of the boiler plate, against which rested the gasket separating the manhole plate from the same, is found by the board to have a depression over an arc subtended by a chord 6.5 in. in length. This depression varies in depth from 0.02 of an inch to 0.065 of an inch and is approximately of the breadth covered by the flange of the manhole plate. The pressure of the plate against the gasket was probably less at this than at parts of the periphery of the manhole and this fact undoubtedly favored the giving way of the gasket at this point. The manhole plate does not fit the manhole so closely as practicable, or as, in the light of the accident, seems desirable, as had there been less space between the edge of the manhole and the edge of the outer of the two plates forming the manhole plate, the space open after the giving way of the gasket for the escape of steam and water would have been considerably less and it might possibly have prevented the escape of this portion of the gasket. The plate now in use has given efficient service for some years. The part of the gasket which gave way corresponds closely with the depression noted in the inner surface of the boiler plate about the manhole. The rest of the gasket remained in place and appears to have acted properly. The board observes that the gasket in question appears to be in part composed of plumbago, the lubricating qualities of which would seem to facilitate the escape of any part of it not firmly held when subjected to strong expulsive pressure and when softened by heat and moisture. Refitting the present manhole plate appears to be a necessity to equalize the pressure at all parts of the manhole.

"The board has taken the statements of all the surviving civil employes who were engaged about the boiler in question or in its vicinity; of the officers and men of the ship's force associated with its repair, its testing, and the raising of steam pressure, and of the officers of the Massachusetts having intimate knowledge of the accident, and there is no testimony which indicates neglect of any reasonable precaution or care, or any knowledge of defects in the boiler or its appurtenances. Every possible effort appears to have been made to find and rescue the men caught in the fireroom and the injured received immediate and efficient care. The board forwards under separate cover the gasket in question as removed after the boiler had cooled."

ENGINEER OF GLEN ISLAND COMMENDED

In the report of the steamboat inspectors of the port of New York on the burning of the Glen Island no one is blamed for the loss of the nine lives which resulted from the fire. In an added transcript Theodore T. Mersereau praises the action of the chief engineer and gives him the credit of rescuing those persons whose lives were saved although he was disobeying rules. The inspectors were unable to determine definitely the cause of the fire although testimony led to the belief that it was caused by a defect in the electric lighting plant or wiring in the engine room on the starboard side of the main deck. In his statement Mr. Mersereau says:

> It seems right to mention one man who deserves special notice. I refer to the chief engineer, Robert M. Layman of New Haven, Conn. His quick grasp of the situation and foresight, together with the prompt action at a critical moment, made it possible that all the later efforts of the others were not in vain.

Captain Ira Harris, the supervising inspector, praises the engineer in a letter to the steamboat inspection service, in which he declares:

> The right to criticise is undoubted, and I believe the right to commend should be the same. In this case I would esteem it a privilege to officially commend the action of Chief Engineer Layman. The prompt action of the chief engineer was necessary to save the lives of the people on board. Had he waited long enough to have started the fire pump, or to receive orders from the pilot house, there would have been no survivors. He violated all rules and his presence of mind in recognizing the emergency as higher than the rule, I think worthy of the highest commendation.

This is said to be the first time that the supervising inspector's office has gone on record as praising a man for the violation of any rules, as promulgated by the steamboat inspection service.

The steamer which the Sante Fe Co. is building to compete against the Southern Pacific railroad for the business of transporting the fruit in the Sacramento river district is under construction by Charles T. Foster at the Risdon Iron Works, San Francisco. The keel has been laid and work is progressing. She will be the best equipped and fastest boat on the Sacramento river, carrying passengers as well as freight. Her name will be Francis.

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FEBRUARY 2, 1905.

The annual ship building edition of the Marine Review has been postponed until Feb. 9 in order to make it more complete than was possible this week.

If republicans in the senate desire it the shipping bill can be enacted at the present session of congress. We are informed that democrats will not resort to dilatory motions or filibustering tactics in order to prevent a vote. Republican senators cannot, therefore, justly charge democrats with causing an indefinite postponement of a vote. We are told that the democrats will content themselves with a proper expression of their views in opposition.

The democrats in congress are on record as desiring shipping legislation. As a party they may not favor the entire bill now pending, but it is of the utmost significance that they are evenly divided on the question in the senate commerce committee. Only three democratic senators, Messrs. Mallory, Clay and Berry, signed the minority report. Three other democratic senators on the committee, Messrs. Martin, Stone and Foster, of Louisiana, declined to sign it. Thus divided the democrats cannot and will not attempt to carry on an aggressive fight against the shipping bill in the senate. The democratic members of the senate commerce committee who declined to sign the minority report are not opposed to the shipping bill; possibly they are in favor of it. Never before has there been such a splendid chance to pass a shipping bill through the senate as now.

Senators Frye, Gallinger, Lodge and Penrose should at once make a supreme effort to secure a vote on the shipping bill in the senate. If they fail, they can try again; and they can keep on trying until congress adjourns. In that way they can do their full duty in the matter. What is needed is a vote on the shipping bill in the senate, and the majority in the senate should devise a way to secure a vote.

Our information is that the house will pass the shipping bill whenever the house leaders are assured that it has a show of passing in the senate; that the speaker, and the committee on rules—which is the committee that controls legislation in the house—are ready to fix a date for consideration and an hour for a vote on the bill. We are assured that there are a number of democrats in the house who will not vote against the bill; possibly some democrats will vote for it.

It is now whispered that a few over-timid republican members of the house have said that until the steel schedule of the present tariff are revised they will not vote on the shipping bill. They are ready to place themselves in the attitude of using the shipping bill as a club with which to sandbag the so-called "stand-patters" in the house to consent to tariff revision. We cannot believe that any representative will take such a position, but if he is willing to, he should by all means be afforded the opportunity.

Our shipping industry is in a chronic state of bankruptcy, receiverships and reorganizations. Nearly $100,000,000 of invested capital in ship building yields no profit. Our shipping is the one great American industry that is subject to foreign competition that remains unprotected. For any member of congress to say that he will visit the sins of the steel trust or the steel industry upon the shipping bill would be the flimsiest possible method by which to evade a declaration as to his real position on the shipping bill. To put forward the weak, disorganized, impoverished shipping industry, that for forty-four years has been appealing to congress for help, to minimize the strength of the great, wealthy and thoroughly organized steel gladiator, would be as ridiculous as it would be unfair. That bugaboo should be laid instanter!

And, finally, how about President Roosevelt? In his annual message to congress in December, 1903, he recommended the appointment of a congressional commission to investigate the shipping subject, and report to congress at the next session. The commission was appointed, it investigated and reported and filed a bill in congress to carry into effect its recommendations. The bill has been promptly reported from committee in each branch of congress, and all that is required is that it shall be considered and a vote taken.

For forty-four years the republican party has prom-

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ised protection to American shipping in the foreign trade. Nothing has been done. This neglect is a colossal act of repeated bad faith which should be atoned for, now. Again, we say, how about President Roosevelt? His campaign for the presidency was unembarrassed by the shipping question. Friends of American shipping, at his suggestion, waited a whole year for the fulfillment of republican promises. He may think he has done his full duty in the case, but has he? He has said that the country wants a mercantile marine. How are we going to get it?

If it shall appear that the shipping bill cannot be brought to a vote in the senate because of insufficient time to consider it, the president can provide the necessary time for its consideration by calling an extra session of congress. The announcement of the president's intention to call an extra session of congress to pass a shipping bill would probably render an extra session unnecessary for that purpose; the senate, doubtless, would then find time to vote on the bill at the present session.

The only man who can cause the needed change to be made in senate methods of procedure is the president. If the senate refuses to enact needed legislation the president can keep congress in continuous session and thus force the senate to do business. If senatorial dilatoriness bars the passage of a shipping bill, the president can force action. The momentous question is, will the president do so?

THE ORE TRADE

The Bessemer Ore association, which went out of business about a year ago owing to the fact that its members could not agree upon output and prices, has now been succeeded by the Lake Superior Iron Ore association, which includes in its membership the leading shippers in the Lake Superior district. Mr. Wm. G. Mather of the Cleveland Cliffs Iron Co., who was president of the Lake Superior Iron Ore association. Mr. E. W. Oglebay of Oglebay, Norton & Co. is vice president and treasurer and Mr. Wm. B. Treat is secretary. No action has been taken by the new association concerning the prices that rule at present for ore and the question of output this season is not a subject for much debate. Under normal conditions the policy would probably be against a heavy movement of unsold ore but indications are that this year shippers will be satisfied if they move all the ore that they can sell. A feature of the association will be the gathering of statistics concerning the iron ore trade of the lakes.

Ore sales have been especially active during the past few days and Corrigan, McKinney & Co., one of the largest shippers outside of the United States Steel Corporation, has already sold all the ore that it can produce during 1905. In fact it has had to go into the market to buy ore for its own furnaces and this has also been the case with other large independent consumers who are also producers.

Everyone is looking forward to a year of great activity and indications are that the record for ore shipments will be broken this year. Vesselmen are looking forward to a movement of 30,000,000 tons and there is every reason to believe that such a movement will be obtained. Such a figure would exceed the great movement of 1902 by only 2,500,000 tons. There is practically no unsold ore on dock, and it is moving forward rapidly to the furnaces, much more rapidly indeed than was at first expected. There is enough ore ,however, available so that no shortage may be anticipated before navigation opens. As yet there is no talk of freights for the coming season.

LABOR SITUATION ON THE LAKES

Notwithstanding any reports to the contrary no trouble whatever is to be expected with labor on the great lakes this year. Owners are gradually appointing their mates and the utmost good feeling prevails between them as has already been abundantly indicated within the past two or three weeks. Engineers are disposed to be reasonable and contracts will be closed with them without friction. Little interest is being manifested in the new classification by the engineers because it effects so few interests. The executive committee of the Lake Carriers' association has not as yet held a meeting since the annual meeting of the Lake Carriers at Detroit, but it is a foregone conclusion that labor will be lined up well before the opening of navigation. There is no evidence anywhere to indicate any other condition.

A conference will be held on Monday next at Detroit between the Great Lakes Towing Co. and the men aboard tugs who will be represented by Mr. Daniel J. Keefe, president of the International Longshoremen, Marine & Transport Workers' association. It is probable that contracts will be entered into for the season at that time.

ENLARGING ORE STORAGE PLANT AT RANDALL

Plans are now being worked out by Pickands, Mather & Co. for an enlargement of the old storage plant of the Erie railroad at Randall. The Randall yards have been used by the Erie and Pickands, Mather & Co. for years as a storage place. The unloading equipment at Randall is ample and similar to the great machines on the unloading docks at Lake Erie ports, but the available yard space is practically entirely occupied. The fact that these yards have to be enlarged is further evidence of the growth of the pig iron-making capacity of the country. Old furnaces are being blown in and new ones are going into blast so that the winter consumption of ore is growing rapidly and the storage yards are taxed to provide for it. The extension of the yards, of course, means the placing of contracts for new ore-handling machinery.

LAKE ERIE ORE RECEIPTS

In the table published in the Marine Review of Dec. 29 regarding ore receipts at Lake Erie ports and ore on dock Dec. 1 an error was made in the Cleveland and Buffalo receipts. The corrected figures are: Receipts at Cleveland, 3,572,228 gross tons; on dock at Cleveland Dec. 1, 1,237,033 gross tons. Receipts at Buffalo—Tonawanda, 2,433,601 gross tons; on dock Buffalo—Tonawanda, Dec. 1, 318,793 gross tons. Total receipts at Lake Erie ports for the season of 1904, 17,932,814 gross tons; total on dock Dec. 1, 5,763,399 tons.

Detroit managers have made the following appointments: Adams Transportation Co.—Steamer George L. Craig, Donald J. Duncanson; Thomas Adams, F. B. Cody; Langham, Walter Mahon. Roby Transportation Co.—Steamer L. C. Waldo, John Duddleson. Northwestern Transportation Co.—Steamer Harvey H. Brown, D. Girardin, Sr.; Fayette Brown, D. Sanders; barge George E. Hartnell, Capt. C. L. Allen. William Livingston—Steamer Livingstone, James Doner; T. W. Palmer, George F. Stilphen.

Attorney General Mayer of New York state has held that the bids submitted for the six test contracts of the 1,000-ton barge canal are legal and that Superintendent N. V. V. Franchot of the department of public works has authority to award the contracts.

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WHALEBACKS GO TO THE COAST

Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., has finally disposed of all of the whalebacks of the Steel Corporation's fleet of vessels on the great lakes. The pigs, as they are commonly called, were acquired by the Steel Corporation when it took over the Rockefeller holdings including vessels, railways and mines. Mr. Coulby sold twelve vessels of the whaleback type last week to Capt. Benjamin Boutell of Bay City, representing eastern purchasers. The whalebacks are to be taken to the coast and will be placed in the coal trade between various Atlantic ports. The vessels sold are the steamers E. B. Bartlett, J. L. Colby, A. D. Thompson, G. Colgate Hoyt and the barges J. S. Russell, J. Whitworth, 105, 107, 109, 110, 116 and 126. The barges 117, 127, 201 and 202 had been previously sold so that the total fleet of whalebacks now disposed of is sixteen. These sixteen vessels could move in an average season 639,645 tons of ore. The new tonnage building for the Steel Corporation could carry in an average season about 880,000 tons of ore, but as it will not all be in commission at the opening of navigation the new tonnage will not represent an added carrying capacity for the coming year. The indications are that the Steel Corporation will be required to charter considerable tonnage throughout the year, probably more than it has ever chartered.

The Pittsburg Steamship Co. now has ninety-six vessels on the great lakes, but it is undoubtedly its policy to keep its vessel fleet thoroughly modern and therefore, in course of time, orders for new ships may be expected from this source. With the whalebacks subtracted the average carrying capacity of the Steel Corporation's fleet takes a considerable jump upward. The first whaleback, 101, was launched on the great lakes in 1889 from designs by Mr. Alexander McDougall. It was thought at the time that this type would become extremely popular and this opinion was supported by the fact that orders for twenty of them were given shortly thereafter. But experience proved that their advantages for the special trade of the lakes did not outweigh their disadvantages and none have been built of late years. The Steel Corporation has fifteen of them left but they are all too large to go through the Canadian canals. Owing to their peculiar appearance they will undoubtedly attract great attention in the coasting trade.

AFFAIRS AT HEAD OF LAKES

Duluth, Jan. 30.—According to the report of Deputy Collector Miles, of Superior, the gross value of goods shipped through the port last year was $90,299,000, and only $13,000,000 less than the highest figure ever recorded at that point. This was in spite of the short season, which began very late in the year. The total tonnage handled at Superior was 8,581,000 tons, and the most valuable freight was grain. Twenty years ago the total tonnage handled at Superior was 86,000 tons and the value thereof was $206,000. The business of Duluth—Superior was $17,000,000.

The Tomlinson steamship companies are increasing their capital stock, to care for the new ships under way at lower lake yards. The Interocean Steamship Co. increases to $160,000, the Zenith to $443,000, the Duluth to $445,000 and the Superior to $445,000. These figures represent the cost to the companies above bonds, of the vessels now building, and those already afloat.

There are now in store at the head of the lakes about 16,630,000 bu. of grains, of which nearly half is flax, all of which but one cargo is in elevators. The stocks are increasing weekly, and last week added about 385,000 bu. to them. An increase will probably be kept up till spring, but not in large volume. There are some shipments every week, all rail, and these have been unusually large the past few days. In the past week 80,000 bu. wheat were shipped out, more than half to Minneapolis, of grades that bring more there than here, just now. In flax shipments are made to Chicago, amounting to between 40,000 and 55,000 bu. weekly. Small amounts of oats and barley are going forward weekly also.

CONCRETE WORK ON SUPERIOR ENTRY

Duluth, Jan. 30.—Two years ago bids were received for certain portions of the Superior entry concrete pier work, Lake Superior, largely the construction of the concrete monolith, and these were so much higher than the engineer's estimated that it was decided by the war department to do the work itself. Accordingly a large amount of material was bought, machinery for mixing concrete, conveying it, placing it in subaqueous forms, was secured or built from plans of the department, and many buildings were erected. A railway and several Porter locomotives were included in the material placed. The work of putting down the concrete pier has been in progress during the year 1904 and half the southern pier is completed. The work done is a very fair average of the whole. It is stated by the engineers that the cost to the government of this work, so far, has been at the rate of $5.50 per yard of concrete, while the lowest bid for the same work was $10 per yard. In this figure of $5.50 everything in the way of costs has been charged up, including a depreciation of 85 per cent on the machinery during the term of the work, which is an extremely high figure, as much of this will be worth about as much at the close of the job as before it began.

The continuance of this work during the present season is hinging on the passage of a river and harbor bill between now and spring. Unfortunately this work is not in the list of continuing appropriations such as that under which the Duluth harbor work was done, and is dependent, not on the civil service, but on the more uncertain river and harbor bill. If no appropriation is given the work will cease and a large amount of material and machinery will be unused and perhaps deteriorate to some extent. But bids for the work were based on a continuous appropriation.

CANADIAN CANALS CORPORATION

The Canadian Canals Corporation, Ltd., is the title under which Toronto and New York capitalists are seeking incorporation at the current session of the Dominion parliament. The powers asked for are for the construction of canals and portage railways between a point on Georgian bay and Wabushene and Lake Ontario. Two routes are specified in the application, one of which would necessitate the construction of a canal from Georgian bay to Lake Simcoe, and a portage therefrom to some point on a navigable waterway already existing, but which will have to be deepened and improved, and having an outlet on Lake Ontario, either in Ontario or York county, and the second route calls for a canal and portage railway route from Georgian bay to a point on Lake Ontario in York county probably at Toronto. The proposal is in a very crude condition at present and a number of rumors have got out about it. Generally speaking, however, the plan is to have large steamers capable of navigating the St. Lawrence canals, and to carry these steamers over the portages on specially constructed cradles which will be drawn to the next canal stage by steam or electric power along an eight-track railway. G. Bell, Wellington street, east, Toronto, is the attorney for the promoters, and the engineer who has planned the route and designed the special apparatus for the portage railways is H. S. Spaulding, C. E., of New York.

The Western Transit Co., the lake end of the New York Central railroad, has bought the Rutland Transit Co.'s fleet of vessels which operates between Ogdensburg and Chicago. The New York Central recently purchased the Rutland railroad and the vessel property has now been included.

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AROUND THE GREAT LAKES

Capt. H. G. Haybarger, who was on the steamer George W. Roby last season, will sail the steamer Francis L. Robbins during the coming season.

Patrick H. Garrity, for several years assistant keeper of Presque Isle harbor light, has been appointed lightkeeper at the new Middle Island light station.

Capt. F. A. Bailey will bring out the big steamer William E. Cory, now building at South Chicago for the Steel Corporation. He sailed the Malietoa last year.

Representative Darragh has finally secured the embodiment of a provision in the appropriation bill to lay a cable between Beaver island, Lake Michigan, and Charlevoix.

At the annual meeting of the National Steamship Co. at Sheboygan, Wis., Capt. J. G. Keith of Chicago was elected president and D. W. Harper of Erie, Pa., vice president.

The Anchor Line of Buffalo has filed a mortgage for $1,500,000 in favor of the Girard Trust Co. of Philadelphia. One thousand twenty-year 4 per cent bonds at $1,500 each will be issued for contemplated improvements.

Winter navigation on Lake Michigan has been quite severe and when the Goodrich steamer Atlanta is released from the ice track of Grand Haven she will abandon winter service. The vessel has been operated at a loss owing to the recurring ice blockades.

Capt. Timese Lemay, who has been ill at his home, 268 Joseph Campau avenue, Detroit, for several weeks, was presented last week by the Detroit lodge of the Ship Masters' association with a beautiful testimonial in recognition of his long services as treasurer of the lodge.

Mr. D. J. Keefe, president of the International Longshoremen, Marine & Transport Workers' association, will hold a conference with the representative of the Great Lakes Towing Co at Detroit on Feb. 6. It is probable that arrangements will be made at the conference for the season of 1905.

A Milwaukee dispatch says that the C. H. Starke Dredge & Dock Co. is constructing a new dry dock and marine railway combined at that port. Instead of being built below the water level with a lock construction the Starke dock will be above the water line and the boats will be hoisted into it by means of mechanical apparatus.

When the Guardian Savings & Trust Co. took over the Federal Trust Co. one of the assets that was not absorbed was 3,500 shares of American ship common which had been bought by the Federal Trust as an investment. The Guardian Trust has now decided to distribute this stock to the Federal stock holders in the form of a dividend.

Walter D. Oades, Detroit, has received an order to build a steam yacht for R. D. McSweeney, Saratoga, N. Y. The yact is to be 96 ft. over all and 17 ft. 4 in. beam. She will be driven by two triple-expansion engines of 75 H. P. each, supplied with steam by a Dearing water-tube boiler. The engine is being built by the Detroit River Iron Works.

Bids for dredging the new upper point channel will be opened at the office of Lieut. Col. Charles E. L. B. Davis, government engineer in Detroit, on Feb. 16. The work consists of dredging a 400-ft. straight channel from below Bois Blanc lighthouse to a point about five miles down Lake Erie. The estimated cost of the work is about $400,000 which is available at the present time.

The sawmill of Peyton, Kimball & Barber at Superior has been sold to a wrecking company at Duluth and will be torn down. It was the oldest mill at the head of the lakes and has contributed about 350,000,000 ft. of lumber to the lake cargo trade. The company has been without standing pine for some years, and the only surviving partner, Mr. Peyton, does not care to continue the business.

The Whitney Transportation Co. has sold the schooner Melbourne to Wm. Burns in Detroit who will have her repaired and used as a lumber carrier. The Melbourne was sunk in collision with the steamer Thomas Cranage last summer but was raised and taken to Detroit. The underwriters paid some $16,000 to the Whitney Transportation Co. as damages. No repairs have as yet been made on the Melbourne.

The meeting of the International Waterlines Passenger Association was held in Buffalo last week. The following officers were elected: President, C. E. Markham, Buffalo; vice president, Joseph Berolzheim, Chicago; secretary, N. R. Nelson, Buffalo; executive committee: R. F. Church, Chicago; F. W. Hibbard, New York; F. C. Reynolds, Milwaukee. Auditing committee: C. E. E. Usher, Montreal; A. W. Hepburn, Picton, Ont.; W. H. Cochrane, Chicago. The meeting was devoted to the discussion of rates.

A. Booth & Co., Tribune building, Chicago, operating the United States & Dominion Transportation Co., have recently organized a marine department in connection with their business which has been placed in charge of Henry H. Brigham. All matters pertaining to the operation and equipment, etc., of the steamers sailing under the flag of the United States & Dominion Transportation Co., as well as of operation and outfitting of the fishing tugs owned by A. Booth & Co. will be in charge of this department.

Arguments on exceptions to the commissioner's report in the admiralty case of the Lehigh Transportation Co., owners of the Oceanica, against the Wm. Chisholm, were submitted last week to Judge Swan at Detroit. This action was begun in September, 1896, and in July, 1899, the case was practically reversed, Judge Swan entering a decree finding the Oceanica wholly at fault for the collision. In November, 1904, the commissioner's report was filed, placing the damage at $40,000. Exceptions to this report are now being argued.

The Buffalo elevator pool is practically established again on the basis of last season. Only the Frontier and Eastern are out and they will be likely to come in on their former percentages rather than make a fight, although the Frontier is doing a large business now on account of being the carrier for the Washburn-Crosby flour mill. There has been considerable demand, or rather grumbling without making a direct demand, for a reduction of the shoveling rates, but elevator men say it cannot be done, even if Canadian ports do underbid us. For the most part the low Canadian rates are found to be made to vessels controlled by elevator men.

After having been the subject of much litigation during several years past to decide ownership, the steamer Gordon Campbell has again changed hands. Several years ago the Campbell was the property of Barry Bros., who transferred her to W. F. Carroll, a Chicago attorney. After operating the boat without profit, Carroll attempted to force the Campbell back upon the Barrys, without success. In the bill of sale just filed at the customs house at Chicago the steamer is transferred by the Ontario Navigation Co., of which W. F. Carroll is president, to Isaac D. Adams of Des Moines, Ia. The consideration is $1,300. The Campbell was badly damaged by fire in Chicago river last fall and has not yet been repaired.

The merits of the new iron range in Crow Wing county will soon be known, now that it has attracted the attention of some of the large operating companies. The district is called the Cuyuna range, and Cuyler Adams of Duluth and his associates have been patiently exploring it for the past two years. It was learned that Pickands, Mather & Co. of Cleveland, one of the large independent mining concerns, has taken options from Mr. Adams on several tracts on the new range and will begin exploring them at once. The results will be awaited with considerable interest in iron mining circles. It is understood that the tracts under option to Pickands, Mather & Co. are new properties on which Cole and McDonald drills have shown ore.

Secretary Charles Moore of the Union Trust Co. of Detroit announces that the trust company is to trustee two issues of

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steel steamship bonds of $160,000 each. The Interocean Steamship Co. is having the Great Lakes Engineering Works build the steamer James E. Davidson. The vessel will be 524 ft. long over all and 54 ft. beam and will have a capacity of 9,000 tons. The Zenith Steamship Co. is having a steel steamer built by the same firm of the same dimensions, the name of which has not yet been determined. The bonds of $160,000 on each steamer are ten-year 5 per cent serial bonds. Although the bonds will not be ready for delivery until April 1, the Union Trust Co. is now receiving subscriptions for them on a 5 per cent basis. That is, the payments made now will draw 5 per cent interest from the date of payment.

Contracts have been signed by the Chicago & Great Lakes Dredging & Dock Co. for the construction of a new slip leading from the Calumet river to the coke plant now being constructed at 112th street for the new Semet-Solvay Co. The slip is to be 1,200 ft. long by 175 ft. wide, with an average depth of 22 ft., giving it ample capacity for any ship now sailing the lakes. It is expected that the slip will be completed by spring, at which time one of the ovens will be ready for use. It is planned by the coke company to bring its coking coal in ship loads from the lower lakes and its products will be largely used in the furnaces at this point. The entire plant will probably not be finished for a year.

It is reported from Duluth that the Duluth & Iron Range and the Duluth, Missabe & Northern roads have doubled their orders for steel cars and locomotives to increase their ore handling facilities this year. The original order of the Duluth & Iron Range was for four new locomotives and 300 steel cars, but this has now been increased by five locomotives and 200 cars. The Duluth, Missabe & Northern's original order was for 800 ore cars and six locomotives. This has been increased by 500 cars and six locomotives. When the new orders are filled the Duluth & Iron Range will have 1,350 steel ore cars and the Missabe road 1,805 of this class. The Steel Corporation, which owns these two routes, is spending $5,000,000 on new equipment and boats for delivery this year. The Great Northern road is also increasing its equipment for handling ore. The company has orders in for twenty-five locomotives for the system and some of these will be devoted to hauling ore, as they may be needed. The road is buying 350 new steel ore cars, which will make a total of 2,050 ore cars in the Great Northern service.

Pulling the two halves of a big steel steamer 72 ft. apart in eighteen minutes was the record breaking feat performed at the ship yard of the South Chicago Ship Building Co. on the Calumet. The boat was placed in dry dock a fortnight ago and workmen cut out all the rivets in a line around the hull two-thirds of the ship's length from the bow. The forward end of the steamer was on well greased ways, and eighteen minutes after the word was given there was the required space between the two parts ready to be filled in with new plating. When the operation was completed it was found that the two sections were but a few inches out of line. Owing to delays in the delivery of steel, the work of installing the new section has not yet been begun. It will take about thirty days to complete the job, which will cost $70,000. Work on the new steamers Elbert H. Gary and W. E. Corey, building for the Steel Corporation, has been held back by bad weather and lack of material, but a force of 650 men is now rushing them to completion. One boat is now 33 1-3 per cent finished and the other 20 per cent. The first will be launched in March and the other about thirty days later.

Illinois and Chicago representatives are anxiously waiting for the river and harbor bill that is expected to be reported from the committee within a few days, when the fate of the requests for over $1,500,000 asked for by them will be known. That this amount will be scaled down is understood because of the general policy of retrenchment by congress. Chicago's needs for the extension of the pier and the dredging of the basin call for $200,000. Twice that amount has been asked for the work on Calumet river to extend the channel from 102d street to the junction of the river with Lake Calumet. Twenty feet of water is needed to 126th street and 16 ft. above that. About $5,000 is asked for a survey for the west fork of the south branch. This is opposed by the International Harvester Co. interests, who claim they do not want the channel deepened. It is explained that the harvester interests own a switch track railroad system that takes care of the freight from that section of the city and if the west fork is deepened it will cut into its business. Some time ago the same interests failed in an attempt to have a stationary bridge built over the channel at Western avenue, in that way shutting off all hope of deepening the channel.

CHICAGO GRAIN REPORT

Chicago, Feb. 1.—Much interest has been aroused over the direct export rate recently adjusted between the eastern and western railroads and the probability thereby of an effect detrimental to lake interests. Experts believe, however, that, as an ultimate proposition, this overhauling of railroad traffic conditions will work much to the benefit of general lake interests. In discussing the situation E. J. Fleming & Co. say that as between the grain shippers and the railroads the adjustment but reflects a co-operative effort to abate certain discriminative tendencies and makes to effect in no small degree the re-establishment of Chicago and adjacent ports as the common center of activity in receipt of distribution of western grain.

The present through shipping position by which the former export rate basis of 25½ cents per 100 lbs. from Missouri river to New York and reduced by agreement between eastern and western rail lines to the basis of 18½ cents per 100 lbs., is an outgrowth of special energy on part of prominent Chicago grain interests in conjunction with the Chicago Board of Trade's traffic department. The object being not only to overcome an extensive diversion of western corn via the New Orleans and Galveston markets, but the removal also of obstructions to the export marketing of grain "stored" in Chicago elevators. This southern routing, it may be noted, accounting for disbursement of an aggregate 10,000,000 bu. of corn, demonstrates the necessity of the action.

The through Missouri river-New York basis having been so adjusted, in natural sequence, the export rail basis from Chicago to New York was reduced to 13½ cents per 100 lbs., and while this may not be sufficiently low, compared with 18½ cents Missouri river-New York, the step at least results in activity on part of buyers looking to increased Chicago storage.

It must be admitted that these wholesome reductions will immediately favor the railroad routing eastward as against the vessel. However, it seems logical, in the contemplated extra volume of grain movement to this market, that the lake carrier stands shortly to meet with much improved demand.

The winter fleet at this and neighboring ports is about equal in available grain carriers to a year ago and stocks of grain, as noted below, are self-explanatory. The rate basis, while nominally at 2½ cents on corn, must turn naturally on the force and time of shippers' inquiry. However, it is the concensus of opinion amongst our shippers that general conditions are favorable for a steady grain movement throughout the coming season.

The stocks of grain in local elevators:

	This week.	Last week.	Same week last year.
Wheat	3,837,000	3,826,000	5,993,000
Corn	7,510,000	6,900,000	4,672,000
Oats	4,737,000	2,577,000	4,223,000
Rye	408,000	442,000	360,000
Total	16,492,000	13,835,000	15,248,000

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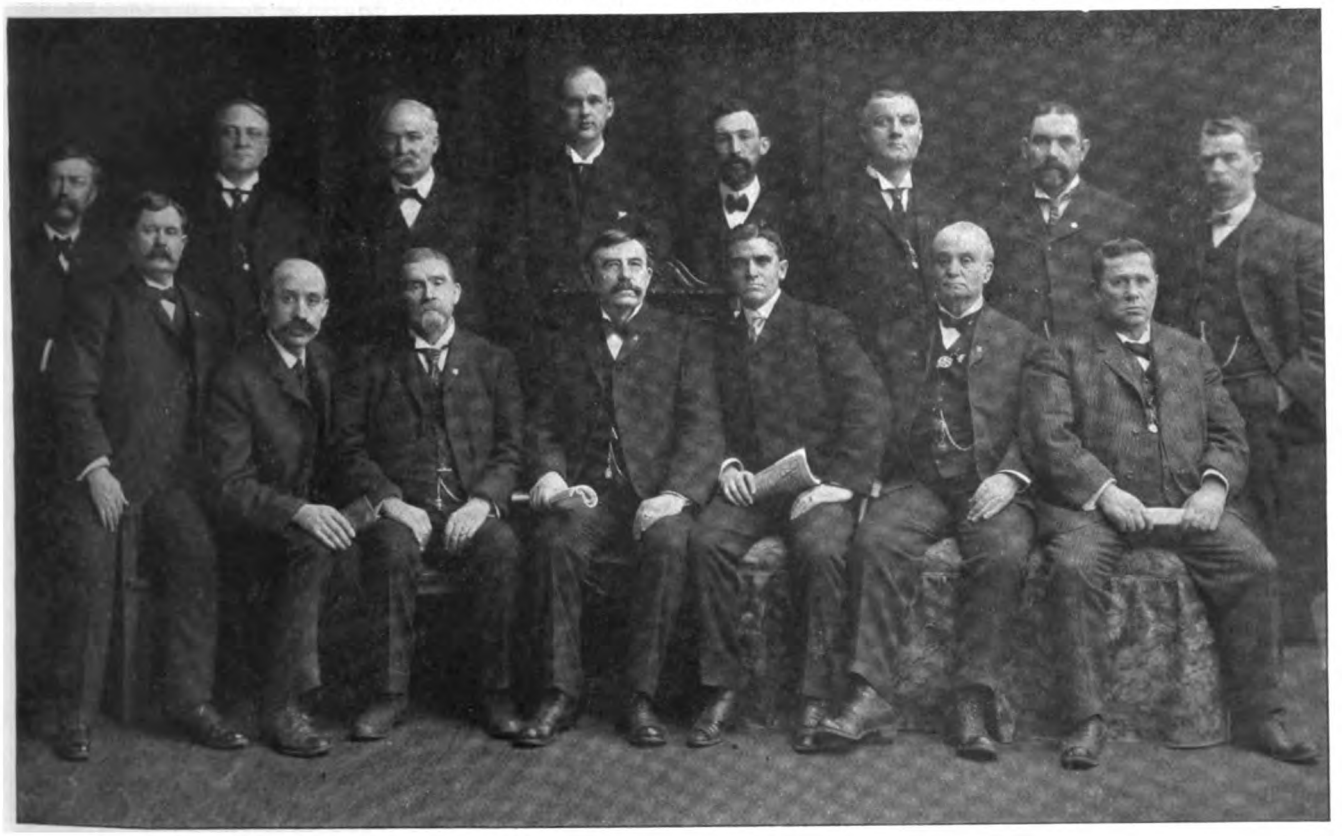
SHIPMASTERS CONCLUDE IMPORTANT MEETING

The grand lodge of the Shipmasters' association, which has been in session in Cleveland for the past week, has now concluded its business. No more important meeting of the grand lodge has ever been held. The meeting was marked by the great interest which was taken in it by the owners of vessels and before adjournment the owners had been admitted as honorary members of the association. Officers were elected as follows: Capt. James A. Calbick of Chicago, grand president; Capt. Wm. D. Ames of Cleveland, grand vice president; Capt. Thomas Jones of Cleveland, grand treasurer; Capt. F. B. Higgie of Chicago, grand secretary. The following committee was appointed to take up the subject of admitting the vessel owners to membership: Capts. W. D. Ames, Charles Woodford, A. H. McLachlan, S. C. Allen, Ralph E. Byrnes, C. E. Benham and M. Mulholland of Cleveland, Capt. R. W. England of Detroit and Capt. James A. Calbick of Chicago. This committee spent considerable time in looking over the constitution and by-laws and on Monday concluded to recommend to the different lodges that vessel owners, stockholders and managers be admitted as honorary members. Terms for admitting them to membership were arranged. The honorary members are to pay an initiation fee of $10 and the ordinary dues of regular members which are $10 per year. Honorary membership will entitle them to take part in all discussions but carries with it neither vote nor claim upon the death fund.

These terms were accepted by the vessel owners at a meeting held at the office of Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., late Monday afternoon. Capt. John Mitchell acted as chairman of the meeting and Mr. W. B. Castle secretary. The owners present in addition were J. H. Sheadle, W. P. Murray, W. H. Teare, Arthur Hawgood, W. B. Davock, C. O. Jenkins and H. F. Lyman. Subcommittees composed of Harry Coulby, Harvey D. Goulder and W. H. Teare for the vessel men and Capts. Calbick, Ames and Byrnes for the shipmasters, were appointed to put the articles of agreement in suitable shape to be acted upon by the various lodges of the Shipmasters' association. Undoubtedly the action of the committee will be ratified at once so that the owners will be members of the Shipmasters' association before the opening of navigation in the spring. The next meeting of the grand lodge will be held in Buffalo.

It is the earnest desire of the owners to cement and consolidate the Shipmasters' association in every way. To that end every assistance will be rendered to them in the projection of entertainments that will serve to broaden their minds. Lectures will be given upon subjects pertinent to navigation and entertainments provided that will serve to attract the owners quite as much as the masters. It is therefore to be expected that at the initiative of the owners new and more desirable quarters will be secured for the Shipmasters' association in Cleveland. One feature of it will be a large general room which can be used for a great variety of purposes and which will be so furnished as to make visits to it most attractive.

The annual reception and ball of the Shipmasters' association was given in the Chamber of Commerce, Cleveland, last week. The affair was a success in every way.



GRAND LODGE, SHIPMASTERS' ASSOCIATION.

Top row, reading from left to right:—F. D. Doville, George Stephenson, James McGinn, Fred Wadham, Charles A. Potter, A. H. McLachlan, A. J. McKay and J. H. McDonald.
Bottom row, reading from left to right:—A. C May, W. D. Ames, Alex. Clark, James A. Calbick, H. H. Parsons, F. B. Higgie and Thomas Jones.

The Great Lakes Engineering Works of Detroit, Mich., purchased of the Niles Tool Works Co., Hamilton, O., the large horizontal boring and milling machine which they had on exhibition at the St. Louis fair. This tool is one of the largest of its kind in the United States and it is the intention of the Great Lakes Engineering Works to use it on their marine engine and ice machinery work of which they have very large orders.

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CANADIAN SHIPPING NOTES

Capt. W. Rogers has been appointed harbor master at New Westminster, N. B.

N. P. Horton has been appointed measuring surveyor of shipping at Owen Sound, Ont.

The Toronto city council has decided to build or purchase a dredge for work at the island.

Capt. W. Milner, Capt. P. Hanson and R. Lowrieson, have been appointed members of the pilotage authority for Sackville, N. B.

During the season of navigation there arrived at Montreal 365 sea-going vessels of 1,218,368 tons, against 459 vessels of 1,399,621 tons in 1903.

The steamer City of Topeka is to be repaired and refitted at Victoria, B. C., at a cost of $100,000. She will be put on the Alaskan run when finished.

Capt. Muggah of the steamer Wasis died suddenly at North Sydney, N. S., Jan. 2. He formerly was master of the Black Diamond Line steamer Louisburg.

A stern wheel steamer has been ordered by J. Walter for the Saskatchewan river trade from W. Pearce, Edmonton, Alta. The new steamer will be 80 ft. long by 16 ft. beam.

The French River & Nipissing Navigation Co. has been registered in Ontario to do a general navigation business. The head offices to be at Sturgeon Falls, Ont., and Hamilton

The Ottawa River Navigation officers for 1905 are: President, H. W. Shepherd; vice president, H. Wallis; managing director, R. W. Shepherd; other directors: R. Bolton, A. F. Riddell.

The Muskoka Lakes Navigation & Hotel Co. shows a profit of $21,672.84 on its navigation business, and a net loss of $7,930.95 on its hotel business for 1904. No dividend will be declared, although there is now to credit of profit and loss account $22,680.

T. G. Mitchell, the recently appointed Lloyd's engineering surveyor for British Columbia, was presented with a case of cutlery by the Canadian Pacific railway's steamship staff at Victoria, on resigning as chief engineer of that company's steamer Princess Victoria.

The Nelson River Packing Co., of which J. K. McKenzie of Selkirk, Man., is one of the principal promoters, has been incorporated under a Dominion charter with a capital of $40,000 to carry on a general navigation business on Lake Winnipeg and elsewhere in Canada.

The Turbine Steamship Co., reports a successful season for 1904. The officers for the year are: President, J. Moodie; vice president, C. A. Birge; secretary-treasurer, G. Hope; other directors: C. S. Wilcox, W. C. Hawkins of Hamilton; Ed. Hyslop and Col. Davidson of Toronto.

E. W. McKean, inspector of boilers and machinery, Toronto, has had his headquarters removed to Collingwood, Ont. The report that W. Evans, inspector of hulls, Toronto, would also remove his office to Collingwood is incorrect. The removal of this latter office from Toronto would cause a great deal of inconvenience and delay for marine men, if it were contemplated by the department.

The plans for the two new steamers for the Canadian Pacific railway, for which orders will be placed with the Fairfield Co., Glasgow, Scotland, are being considered at Montreal. The steamers will be 550 ft. long between perpendiculars, with a 65 ft. beam, and will have a gross tonnage of 14,500 tons. The engines are designed to drive the steamers at 20 knots an hour. Accommodation will be provided for 300 first-class, 350 second-class and about 1,000 steerage passengers.

The minister of marine has refused to sanction the finding of Capt. Salmon, late commissioner of wrecks, in the collision between the Capt Breton of the Black Diamond Line, sailing between Sydney, N. S., and Montreal, and the Richelieu & Ontario Navigation Co.'s steamer Canada, off Sorel, Que., June 18, 1904. The ex-commissioner found the pilot of the Canada entirely at fault and suspended his certificate. This has now been restored and the fines imposed remitted.

The order-in-council recently passed relating to the inspection of shipping in Canada revokes the order of 1904, and makes it compulsory that all vessels carrying freight, from port to port in Canada shall be subject to the Canadian steamboat inspection act. It further provides that all tugs, yachts or other vessels registered elsewhere than in Canada, shall be subject to the like inspection. This latter regulation will apply to yachts, motor boats, etc., which are brought to Canada during the summer season by United States tourists.

The Dominion government has issued an order bringing into force a new set of rules for the inspection of steamboats and for the examination of engineers of steamboats. The new rules are a consolidation of the Canadian rules for the inspection of steamers and for the examination of engineers along with a number of amendments rendered necessary to bring the same up to date. The new rules came into force Jan. 1, and all previous rules are abolished, except those adopted Nov. 12, 1904, respecting the inspection of passenger vessels propelled by gas, fluid, naphtha, electricity or any mechanical or chemical power other than steam.

The Niagara, St. Catharines and Toronto Navigation Co., which operates the steamers Lakeside and Garden City between Toronto and St. Catharines, Ont., during the summer, has been purchased together with the electric railway and their properties of the Niagara, St. Catharines and Toronto Railway Co., by a Toronto syndicate. The new company will have as its president, F. Nicholls of the Canadian General Electric Co., Canada Foundry Co., Canadian Ship Building Co., and other enterprises, and among its directors will be D. D. Mann of Mackenzie, Mann & Co., railway contractors, Toronto, and connected with the Canadian Lakes & Ocean Navigation Co.

The ship building and engineering firm carried on in Toronto as the Polson Iron Works has been registered as a joint stock company under the Dominion companies' act with a capital of $1,000,000 and offices at Toronto. The company will take over the present yards, business and contracts of the Polson Iron Works, and is given power to carry on the same, acquire other works of a similar character, or purchase stock or bonds of the same, and to acquire lands for the extension of the present works. The provisional directors are: A. H. Jefferey, assistant manager of the works; W. B. Tindull, the accountant; J. J. Main, boiler superintendent; Mrs. F. B. Polson and Mrs. J. Miller.

A company is in course of formation in Toronto for the purpose of construction of a canal from a point on the Georgian bay between Waubushene and Midland, Ont., to Lake Simcoe, and from the southern shore of that lake to some convenient point in the county of York, near Toronto. This project has been mooted at different times for some years, but nothing definite has ever been done. The Dominion government is constructing the canal from Georgian bay via the Severn river to Lake Simcoe; from Lake Simcoe by a number of short lengths of canals, connecting navigable rivers and lakes to a point on Lake Ontario. This stretch of navigation is known as the Trent Valley canal, and it was originally proposed to have the Lake Ontario outlet at Trenton. There is some 130 miles of the navigation open for barges drawing 8 or 9 ft., and contracts have been let for the completion of the canal into Lake Simcoe. This work, it is expected, will be completed for the opening of navigation in 1906. The question of terminals is under consideration by the government. An alternative route to the Severn river has been urged, and Port Hope is agitating to be made the Lake Ontario outlet instead of Trenton.

The Northern Navigation Co. has issued a warrant against the estate of the late J. J. Long, its former president, to re-

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over $83,000 odd, and interest from June, 1904, an agreed amount, or in the alternative $150,000, for fraudulent representations and acts. Owing to certain charges made in November, 1903, an investigation of the accounts were made, and upon the special auditor's report the Long contract of the company was broken. When H. C. Hammond, the new president, and H. H. Gildersleeve, the new manager, got possession of the books they found that the dividend declared in 1903 had not been earned, but had been paid out of the reserve fund, and that the allegations that the ex-president's firm had enjoyed special freight rates as against other shippers, that their customers were granted free transportation on the company's boats; and that supplies for the steamers were purchased from the president's firm without giving other firms a chance and other charges were fully borne out. As a result the late J. J. Long agreed to settle the affair by the payment to the company of $83,000 odd. Before the date when the payment was to be made his body was found in the Don river, Toronto. All efforts to recover the money from the estate have failed, hence the action.

A company has been incorporated at Ottawa for the purpose of constructing a dam across the southern outlet of Lake Temiskaming, and to erect wharves, docks, etc., on the shores of the lake. The promoters of the company, which is styled the Temiscamingue & Mechiskan Dam Co., are Sir A. P. Caron, C. B. Powell, R. J. Devlin, R. V. Sinclair, J. A. Ellis of Ottawa, Ont., E. B. Eddy, and W. H. Rowley of Hull, Que. The site of the proposed dam is near Temiscamingue, Que., the terminal point of the Canadian Pacific railway branch line from Mattawa, Ont., at which point lake navigation commences. The effect of the dam will be to raise the level of the lake to such an extent as to enable larger vessels to be used on the lake and the navigable rivers flowing into it, viz., Opemicon, Montreal, Whabis and Blanche; and maintaining its waters at a uniform level all through the season. The principal trading points on the lake are Temiscamingue and Ville Marie on the Quebec side, Haileybury, New Liskard on the Ontario side, and Tomstown, Ont., some 20 miles up the Blanche river. There are two lines of steamers carrying freight and passengers between Temiscamingue, Que., and New Liskard, Ont.; two freight and passenger steamers run between New Liskard and Tomstown, Ont., and there are numerous tugs and barges engaged on the lake and rivers. Outside of package freight, the principal trade is lumber. The Ontario side from Haileybury north and west is being rapidly settled, nearly 3,000 families having taken up land within the last three or four years. South and west of Haileybury some very rich mines have been opened up, and considerable mining development is looked for. The Kippewa lakes, in Quebec, and Lake Temagami, in Ontario, can be reached from Lake Temiskaming, and both districts are being largely visited by tourists from the United States. The Ontario government has just completed a line of railway from North Bay to New Liskard, 112 miles, touching the lake at Haileybury, and is extending the line for 100 miles northerly to Lake Abitibbia.

CANADIAN VESSELS CLASSIFIED

According to the Railway & Shipping World the number of steamers registered in Canada on Dec. 31, 1903, was 2,410, having a gross tonnage of 338,251 tons. An examination of the list shows that of these 2,021 were built in Canada, 275 in the United States, and 75 in Great Britain, and of the remainder some details are wanting in order to classify them properly. They include ten built in Canada, seven in the United States, and two in Great Britain, in regard to which the year of building is not given; four built in Hong Kong, one each in Sweden and Norway, and fourteen in regard to which neither the date of building nor the country where built is given. Of the 2,371 of which full details are given, the following table shows the year when built, and whether in Canada, the United States or Great Britain. It would be interesting to know when the British or United States built vessels were placed on the Canadian register.

Year.	Canada.	Great Britain.	United States.	Total.
1903	97	2	3	102
1902	113	5	9	127
1901	106	1	9	116
1900	109	1	11	121
1899	87	1	5	93
1898	107	3	17	127
1897	96	0	3	99
1896	73	1	8	82
1895	69	1	3	73
1894	80	1	3	84
1893	82	4	15	101
1892	76	0	3	79
1891	76	2	10	88
1890	80	5	7	92
1889	66	5	5	76
1888	72	7	12	91
1887	65	1	8	74
1886	69	1	7	77
1885	45	1	5	51
1884	51	2	10	63
1883	47	5	2	54
1882	40	1	6	47
1881	37	4	8	49
1880	35	2	7	44
1879	27	1	7	35
1878	25	0	4	29
1877	15	2	5	22
1876	18	0	5	23
1875	18	3	7	28
1874	23	0	14	37
1873	17	1	9	27
1872	20	0	4	24
1871	14	3	5	22
1870	15	1	6	22
1869	7	1	5	13
1868	10	0	4	14
1867	7	1	5	13
1866	6	0	0	6
1865	3	1	4	8
1864	5	3	5	13
1863	2	0	5	7
1862	3	0	4	7
1861	2	1	1	4
1850	1	0	0	1
1856	1	1	0	2
1846	1	0	0	1
1845	1	0	0	1
1844	1	0	0	1
	2,021	75	275	2,371

The tonnage of 2,407 out of the 2,410 steamers on the list is given. Of these over 1,800 are under 100 tons gross, and they include not only tugs, fishing steamers and small trading steamers on the inland lakes and rivers, but a large number of pleasure craft. A large proportion of the vessels built in the United States and borne on the Canadian register belong to the class of pleasure steamers of less than 10 tons gross, while the British built steamers figure largely among the big bulk freighters. A classification according to tonnage shows:

Under 10 tons gross	548
Over 10 and under 50 tons gross	951
Over 50 and under 100 tons gross	338
Over 100 and under 200 tons gross	198
Over 200 and under 300 tons gross	96
Over 300 and under 400 tons gross	57
Over 400 and under 500 tons gross	44
Over 500 and under 600 tons gross	32
Over 600 and under 700 tons gross	23
Over 700 and under 800 tons gross	20
Over 800 and under 900 tons gross	19
Over 900 and under 1,000 tons gross	20
Over 1,000 and under 1,500 tons gross	23
Over 1,500 and under 2,000 tons gross	22
Over 2,000 and under 2,500 tons gross	6
Over 2,500 and under 3,000 tons gross	5
Over 3,000 and under 4,000 tons gross	4
Over 4,000 and under 5,000 tons gross	1
	2,407

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TRIAL TRIP OF THE MARYLAND

The armored cruiser Maryland, built by the Newport News Ship Building & Dry Dock Co., Newport News, Va., in her trial trip last week over the Cape Ann course made an average speed of 22.306. Tidal correction is expected to increase this average somewhat.

The arrangements for the trial were perfect and the start was most auspicious. The cruiser slowly steamed out through Broad sound for Thacher's island. Forced draft was on and the monster was rushing for the Minneapolis, the first of the stake boats. The buoy that marked the starting line was passed at 9:17:57 and the cruiser was away on her race against time.

A stiff wind on the quarter and a ground swell, together with the shoal water of the first twelve miles were handicaps that retarded the warship from her best efforts. The Orion, the second stake boat and marking the first 6.6 miles of the course, was passed at 9:36:04, in 18:07 minutes from the starting line. The speed was 21.858, just under the required limit. The next leg of the course was a duplicate of the first, in exactly the same time and at exactly the same speed.

But now the shoals of the early portion of the course were passed and the swell was less vicious. With a greater rush and throwing the sea in huge billows over her forward deck as far back as the conning tower, the Maryland settled down to her task and right nobly made her performance. The third buoy, unattended by any craft, was passed at 10:11:53, in 17:42 minutes, or at a speed of 22.37. The Newport, the Yankton, the Underwriter and the Chattanooga, the remaining stakes in the outward course, were successively taken up at a speed of from 22.16 to 22.36. The time for the 44 miles was 1 hour 59 minutes 14 seconds, and the average speed 22.15 knots, tidal allowances not included.

The homeward trip was made at increased speed. The fourth leg was done at a 22.846-knot speed, the fastest speed attained during the trial. The slowest leg of the homeward run was the sixth, at 22.94 knots.

At the end of the outward run and at the finish the usual turn and figure "8" were made. The turn at the end of the first half took 14:17 minutes, an exceptionally fast performance. The figure "8" at the end of the course won the highest praise from the naval officers, who declared that the circle radius was the smallest ever accomplished by a ship of the Maryland's class.

A feature of the test not apparent to the casual observer was the work in the engine room. Engines designed for 23,000 H. P. developed 27,000, and screws that were supposed to revolve at 120 revolutions per minute at the maximum turned at the rate of 128.42 for the starboard screw and 128.55 for the port.

The ship was commanded by Captain W. G. Melvin. At the wheel during the entire course was Quartermaster Martin Bendixon, a veteran of the historic Kearsarge. The members of the trial board were Capt. James H. Dayton, Capt. Leutze, Com'dr Potts, Com'dr Reeves, Naval Constructor Woodard, Capt. R. R. Ingersoll, who will command the cruiser when she goes in commission, and Lieut. Com'dr Maxwell. The builders were represented by C. B. Orcutt, president of the company; Walter A. Post, the general manager, and C. D. Locke, the president's secretary.

The leading features of the Maryland are: Hull, length on load water line, 502 ft.; beam, extreme, 69 ft. 6½ in.; draught on normal displacement of 13,000 tons 24 ft. 1 in.; full-load displacement, all ammunition and stores on board, 15,104 tons; designed indicated horse power, 23,000 to 25,000; contract speed, 22 knots; coal supply, full bunker capacity, 1,850 tons; complement of officers, forty-seven; complement of seamen, marines, etc., 783.

She has two sets of four-cylinder triple-expansion propelling engines, designed for a maximum of 25,000 H. P. at 120 revolutions per minute. Each engine is placed in a separate watertight compartment, and has cylinders of 38½ in., 63½ in., and two of 74 in. diameter by 48 in. stroke of piston. The steam, at 250 lbs. pressure, will be supplied from sixteen water tube boilers of the Babcock & Wilcox marine types. The boilers are arranged in six watertight compartments. The total grate surface of the sixteen boilers is 1,600 sq. ft., and the total heating surface on the tubes is 70,944 sq. ft. There are four smoke pipes, standing fore and aft on the center line of the ship.

Her armor belt extends 5 ft. below and 4 ft. above the normal load line, and from stem to stern. It is 6 in. thick at the top and 5 in thick at the bottom. The maximum thickness is preserved for a depth of 6 ft. from the top. The armor tapers toward the stem and stern to a thickness of 3½ in. The armor on the balanced oval turrets with inclined port plates, is 6½ in. thick on the port plate and 6 in. thick on the sides and rear.

The main battery consists of four 8-in. breechloading rifles, mounted in pairs in each turret on the center line of the vessel. There are fourteen 6-in. rapid fire guns, and a secondary battery of eighteen 3-in. and twelve 3-pounder guns, besides four 1-pounder automatic guns, four 1-pounder rapid fire guns, six 3-in automatic guns, two machine guns and two 3-in. field guns.

BOARD OF TRADE ON MERCHANT MARINE

At the annual meeting of the National Board of Trade in Washington last week Mr. Harvey D. Goulder, chairman of the merchant marine committee of the National Board of Trade presented the following resolution upon the American merchant marine in the foreign trade:

> Whereas, The American people are sprung from the greatest sea-faring races of the world, and have most notably exemplified both by commerce and in war upon the sea the skill and courage of their ancestry, and
>
> Whereas, The great states of Ohio, Indiana and Illinois have been largely developed by the railroad systems which were built by the concentrated capital that grew out of the sea-going foreign commerce of the people earned in the first half of the nineteenth century, and
>
> Whereas, The far west depends for its communications on trans-continental railways which were called into being by subsidies from the national treasury, and
>
> Whereas, A congressional commission has at large expense, and with great patience and personal attention, spent months of time and thousands of miles of travel in examination of the causes of the disgraceful decay of American commerce, and as a product of their labor has proposed a remedy for this decay in senate bill No. 6291, by which a threefold purpose may be obtained, which purpose is expressed, firstly, in the creation of a naval militia reserve; secondly, in the creation of a labor equalization allowance, by which American labor on the ocean may compete, without degradation, with the seamen of Europe and Asia. Thirdly, in the authority to the post office department to spend such sums as will be sufficient to provide direct postal service with the ports of South Africa, South America, and Asia, without attempting competition with the extravagant sums paid by foreign governments for the service between British and North seaports and those on our Atlantic seaboard.
>
> Therefore Resolved, That the National Board of Trade heartily commends the work of the congressional marine commission and urges upon congress the anactment at earliest possible date of senate bill No. 6291.

The Chicago Nautical School, Masonic Temple, Chicago, of which Mr. W. J. Wilson, late lieutenant in the United States navy, is principal, is enrolling lake men among its members at the rate of from three to four per day and it has at present the largest class of lake men in its history. Mr. A. W. Hayden, formerly first officer of the steamer Rome has been selected to assist in the work.

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AMERICAN ASSOCIATION OF MASTERS AND PILOTS

A most successful convention has been concluded at Washington by the American Association of Masters and Pilots. The following officers were elected: Capt. John A. Silva, Boston, president; N. L. Cullen, Camden, N. J., first vice president; W. C. Robertson, Washington, D. C., second vice president; L. B. Dow, New York, treasurer, and Benjamin F. Perkins, Camden, N. J., secretary. Considerable business of interest to the association was transacted. The following resolution upon the necessity of publishing the merchant marine in the foreign trade was adopted.

Whereas, American ships now convey only 10 per cent of the imports and exports of the United States, while 90 per cent are conveyed in foreign ships—thus building up at the expense of the American people the naval reserve of foreign nations, and

Whereas, this condition of affairs deprives American officers and seamen of employment in ocean trade and thus prevents the development of an adequate naval reserve in our own country, therefore

Resolved, that the American Association of Masters and Pilots of steam vessels, realizing the need of American deep-sea shipping and the value of a strong merchant fleet to the nation in peace or war, heartily commends the work of The Merchant Marine Commission, authorized by congress on the recommendation of the president, and urges the prompt enactment of Senate bill 6201, reported by the commission, "to promote the national defense, to create a force of naval volunteers, to establish American ocean mail lines to foreign markets, to promote commerce, and to provide revenue from tonnage."

WINTER MOORING LIST OF LAKE VESSELS

Name of Vessel.	Name and Address of Managing Owner.
CHICAGO, ILL.	
Schr. Alice	Chas. W. Allen, Kenosha, Wis.
Schr. Hattie Hatt	Capt. James Erickson, Milwaukee, Wis.
Schr. Jura	Chas. W. Allen, Kenosha, Wis.
Schr. Jones, John J.	Chas. W. Allen, Kenosha, Wis.
Schr. Lake Forest	Capt. James Erickson, Milwaukee, Wis.
DETROIT, MICH.	
Str. Badger State	Hugh R. Havey, Detroit, Mich.
Schr. Carry, M.	Hugh R. Havey, Detroit, Mich.
Schr. Gebhardt	John Stevenson, Detroit, Mich.
Schr. Groner, A. P.	Hugh R. Havey, Detroit, Mich.
Str. Hattie	John Stevenson, Detroit, Mich.
Schr. Kelley, Ed.	Hugh R. Havey, Detroit, Mich.
Str. Pauly, J. H.	Hugh R. Havey, Detroit, Mich.
Str. Saginaw	Hugh R. Havey, Detroit, Mich.
LUDINGTON, MICH.	
Str. Diver, J. M.	James, Reid, Sarnia, Ont.
Str. Manistique	James, Reid, Sarnia, Ont.
MARINE CITY, MICH.	
Bge. Onconta	H. W. McCormick, Bay City, Mich.
PORT HURON, MICH.	
Str. Thew, M. P.	John Stevenson, Detroit, Mich.
SARNIA, ONT.	
Str. Ottawa	James, Reid, Sarnia, Ont.
Str. Salvor	James, Reid, Sarnia, Ont.
Str. Sarnia	James, Reid, Sarnia, Ont.
Str. Tempest	James, Reid, Sarnia, Ont.
Str. Winslow	James, Reid, Sarnia, Ont.
SAULT STE. MARIE, ONT.	
Str. Reid, James	James Reid, Sarnia, Ont.
TOLEDO, O.	
Str. Miami	John Stevenson, Detroit, Mich.
TONAWANDA, N. Y.	
Bge. Olga	E. B. Dauble, Tonawanda, N. Y.

The four-masted schooner Evelyn Hinkley built for James S. Winslow & Co., Portland, Me., was launched last week at the yard of Percy & Small, Bath, Me. She is 179 ft. keel, 37 ft. beam and 12½ ft. deep. She is a single deck vessel built especially for the lumber trade.

EARNINGS OF BRITISH STEAMERS.

British steamship owners have been taking their reckonings during the past few weeks and statements issued by the British shipping journals show that the year has been a profitless one for shipping in general. The volume of trade has been large but rates have been low. The Russo-Japanese war created an extensive trade in merchandise, contraband and legal, and was extremely profitable for the few that were engaged in it. The British journals argue that as some of these steamers cost about $40 per ton in 1900 and could now be replaced by new ones at $30, a large sum should be written off their value. The serious feature of the existing depression in the shipping trade is the fact that even the most modern boats are not earning a reasonable profit. A trade boom would, of course, alter matters but such a boom is not in sight. Fairplay of London has compiled a table showing that eighteen of the principal companies having a combined capital of £17,438,388 and debentures totaling £10,178,044 were only able to pay a dividend of 4.41 per cent during the past year. The table follows:

	Capital. £	Debentures, etc. £	Dividend. £	Percentage.
National S. S. Co.	225,000	102,833	nil	—
China Mutual S. N. Co.	508,235	250,022	20,272	3.98
African S. S. Co.	647,511	200,230	24,282	3.75
Cunard S. S. Co.	1,000,000	nil	64,000	4
F. Leyland & Co.	2,014,350	1,389,540	35,358	1.35
Orient S. N. Co.	319,332	209,940	15,000	5
Shaw, Savill & Albion Co.	300,750	269,856	19,537	5
Union-Castle Mail S. S. Co.	1,658,410	1,082,901	81,720	4.02
Pacific S. N. Co.	1,477,125	120,030	50,085	4
Indo-China S. N. Co.	495,800	64,000	24,794	5
British-India S. N. Co.	1,675,200	1,507,900	100,700	6.44
Anchor Line	575,000	783,096	30,375	5.28
Prince Line	601,495	199,509	30,074	5
New Zealand Shipg Co.	473,840	588,053	23,692	5
Houlder Line	474,245	327,913	.....	—
P. & O. Co.	2,320,000	1,448,100	208,800	9
Royal Mail Co.	900,000	350,000	.....	—
Clan Line	500,000	1,177,315	25,000	5
	£17,438,388	£10,178,044	£769,745	4.41

PERSONAL

Wm. B. Turner, for many years marine superintendent of the Merchants and Miners' Transportation Co. of Baltimore, has been appointed to a similar position with the Chesapeake Steamship Co.

Capt. George Pardee has been appointed United States inspector of hulls at Grand Haven, Mich. He is one of the best known captains of the Goodrich fleet, having for the past two seasons sailed the Virginia.

James H. Maddy, who has made an enviable record for himself as the press representative of the Baltimore & Ohio railway, has resigned to go with the Erie as special representative. His office will be at No. 95 Liberty street, New York.

A Washington reports says that Mr. Charles H. Keep at present assistant secretary of the treasury, may succeed Mr. Ellis H. Roberts as treasurer of the United States. Mr. Keep was formerly secretary of the Lake Carriers' association.

Orton G. Orr and Joseph S. Wall desire to announce the formation of a co-partnership for the transaction of general marine and inland transportation insurance, under the firm name of Orr & Wall, with offices at suite 47, 48 and 49, Nos. 2 and 4 Sherman street, Chicago.

The New Orleans Terminal Co. has awarded a contract to James Stewart & Co. of St. Louis for the construction of a dock slip and terminals at Fort Chelmette. The dock will be 1,500 ft. long, 250 ft. wide, with a depth of water of 30 ft.

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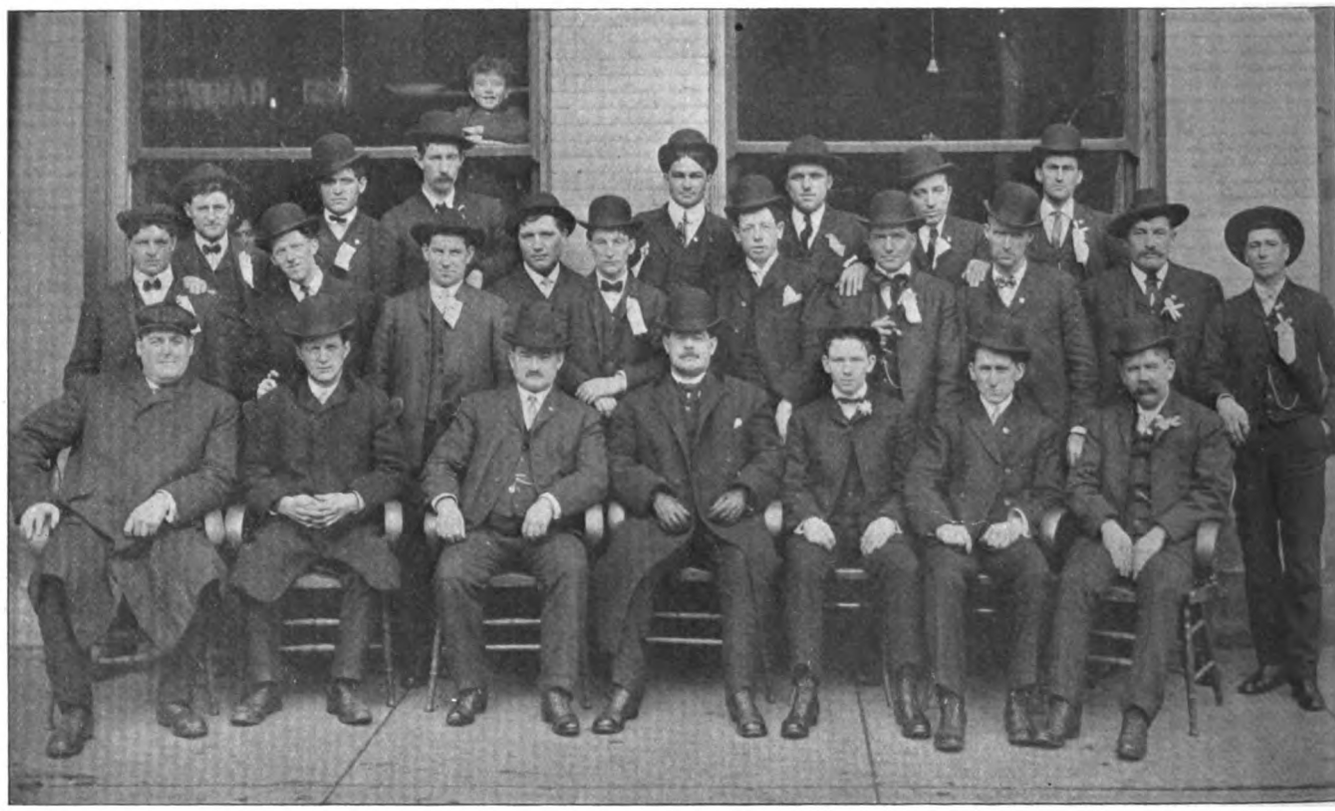
TUG FIREMEN & LINEMEN'S ASSOCIATION

Both business and pleasure were features of the convention held at the New Gruener hotel, Buffalo, from Jan. 16 to Jan. 25 by the delegates of the Tug Firemen & Linemen's Protective association. Among the visitors at the meeting was Samuel Gompers, president of the American Federation of Labor. Mr. Gompers, in addressing the delegates, spoke of the progress of organized labor. His address was enthusiastically received. D. J. Keefe of Detroit, president of the International Longshoremen's association, also took part in the deliberations of the convention.

According to the delegates, the Tug Firemen & Linemen's association is in a flourishing condition. It is said that fully 95 per cent of the tug firemen of the great lakes are included in the organization.

While the terms of the annual wage agreement was not the subject of the conference, the question was uppermost in the minds of the delegates. From the expressions made by some of the members, no trouble was anticipated in the matter of coming to a satisfactory agreement with tug owners. In fact wage contracts will be signed. Previous to this joint conference, delegates from all the lodges of the union will meet and formulate the demands to be made.



GROUP PICTURE OF DELEGATES AT CONVENTION OF TUG FIREMEN AND LINEMEN'S ASSOCIATION IN BUFFALO.

Bottom row, reading from left to right, are :—John J. Joyce, Buffalo ; Cornelius Wild, Buffalo ; Archie Valiquet, Chicago ; Daniel J. Keefe, Detroit ; Edward Doyle, Cleveland ; John J. Burke, Sault Ste. Marie ; Gerst Jordan, Sault Ste. Marie.

Middle row, reading from left to right :—Frank Isabel, Sturgeon Bay, Wis.; George Fowler, Sault Ste. Marie ; T. E. Riley, Buffalo ; Otto Becker, Ashtabula ; Daniel Cotter, Buffalo ; Thomas McNaugh, Cleveland ; Max Etsel, Milwaukee ; John Finan, Chicago ; Frank Winterholder, Chicago ; J. Taylor, Toledo.

Top row, reading from left to right :—William D. Riggs, Port Huron ; George Smith, Toledo ; Ab. Elliott, Duluth ; George Bruce, Ashland ; Michael Goakley, Duluth ; Anthony Weber, Lorain ; George Meener, Two Rivers, Wis.

the relations between employer and employe are said to be perfectly amicable.

At the close of the final session the following officers were elected for the ensuing year: Grand president, John Bourke of Sault Ste. Marie; grand vice president, Max Etzel of Milwaukee; grand secretary and treasurer, M. Glockle of Duluth; assistant grand secretary and treasurer, Daniel Cotter of Buffalo. Mr. Bourke, who succeeded Arch. Valiquet as grand president, was formerly grand secretary and treasurer. In that office he looked after the affairs of the organization well and it was in recognition of his services that he was promoted to the head of the union.

It is expected that the members of the association will confer with the tug owners some time next month, when

OBITUARY

Great sorrow is expressed along the whole chain of great lakes over the untimely death of Capt. Charles M. Davis, wrecking master for David Vance & Co. of Milwaukee. Capt. Davis was found dead in the hold of the steamer Roman at the Illinois Steel Co.'s docks at Milwaukee on Friday night last. He had lain dead in the hold of the boat nearly all day before his body was discovered. He had started to make an examination of the steamer Roman early Friday morning and had fallen through an open hatch. He was all alone at the time of the accident and not until his family had become anxious because he had not come home to dinner was a search instituted for him. He was found by his son, Francis C. Davis, who was accompanied by Carl Joys and Benjamin R. Rogers. In addition to his duties as a wrecking master Capt. Davis was an inspector for Inland Lloyd's Register and it was while he was engaged in work for this company that he met his death. It is surmised that in trying to make the inspection of the Roman complete he had tried to open a hatchway and slipping had fallen into the hold pulling the cover with him. Capt. Davis was 69 years old and had been identified with lake trade for more than forty years. He sailed the great lakes for a number of years, his last steamer being the Roswell P. Flower. Capt. Davis' career as a wrecking master was notable. His most famous exploit was undoubtedly the bringing down of the crippled steamer John T. Hutchinson with a cargo of 190,000 bu. of flax seed. The Hutchinson ran on a rock a little west of Eagle River and literally tore her bottom along the starboard side from stem to stern. Capt. Davis, after making an examination of the

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vessel, felt that he could control the water and navigated the vessel through nearly 1,000 miles of ice blocked and unlighted channels. The vessel was taken in safety to Buffalo and placed in dry dock. The injuries to her hull were found to be of a frightful character. Capt. Davis was born at Erie, Pa., and came of a seafaring family. He is survived by two sons, Francis C. Davis of Milwaukee and Leroy M. Davis of Racine county, and two daughters, Mrs. Harriet Neilson of Milwaukee and Mrs. Ella D. Rohr of Burlington, Wis.

Capt. Thomas Dunn of Milwaukee died at Seattle, Wash., a few days ago. He had been identified with the trade practically all his life but removed about a year ago to Seattle. His last steamer on the lakes was the Keefe.

Capt. R. McGlory, for many years a master of steamers in the Northern Transportation Line between Chicago and Ogdensburg, died at Brecksville last week. He retired from the lakes in 1900.

Capt. J. S. Symes died at Midland, Ont., last week. Capt. Symes was master of the steamer Sequin for a number of years.

CONCRETE-PROTECTED IRON

Now that reinforced concrete has come to stay it would be well for our readers to ascertain the exact position the two constituent factors, concrete and steel, bear towards each other, where they are combined to form permanent structures. That concrete furnishes the required compressive strength, and steel the equivalent tensile strength, is readily admitted and if the matter ended there it would be unnecessary for the investigation to go further.

But the questions arise; supposing that concrete in combination with iron be indestructible, what about the iron? And supposing that the iron be conditionally indestructible, what about the concrete enveloping it?

That work of this class is as a whole sound and reliable we are glad to admit, all we ask is that its permanence should have a little more attention than it seems to be getting, we hold that concrete bridges and skyscrapers ought to have a life estimate of more than twenty years allowed them. It might, and probably does, suffice for a cemented iron vessel, but surely the owner of a fifteen-story building expects he is not to rebuild at the end of twenty years? At the end of that time he could hardly get at any worn out steel to renew it in the meanwhile proper precautions have been neglected.

Our first question is as to the preservation of iron in indestructible concrete. As iron is unaffected only under two conditions, in dry air, and in pure fresh water, that we should expect more from it except when similar conditions are brought about by concrete or some equivalent protecting material is too much. That is to say, if the impermeable and indestructible concrete can envelope steel so as to protect it from oxidation or acid action, a point of the greatest value is gained by the builder and his work will endure.

But is this always possible? We know that iron bolts through heavy timber, which envelopes them so much tighter and closer than concrete and are more impermeable have, in exposed situations, only a limited duration of life. It seems therefore reasonable to conclude that such results would hardly be sufficiently encouraging to induce the steel concrete constructor to needlessly expose his rods to correspondingly severe tests.

The usual explanation is that concrete is impermeable, that water cannot pass through it. Unfortunately, however, there are few natural stones which do not possess absorbent and conductive qualities and compared with some of these cement, not to mention inferior or defective concrete, compares in this respect somewhat unfavorably. All then that the builder requires to complete his work is to waterproof the exterior and this should never be neglected. An outer surface of hard brick or of rich cement mortar often will do all that is required and the life of steel in an ordinary building need not be measured by periods of twenty years.

The next consideration is as to the durability of the protecting concrete. On this point there is plenty of direct evidence, the effects of weather exposure being often well developed. Therefore when there are any signs of cracking on the surface of concrete protective measures should be taken at once and this whether there be steel below or not.

It is now universally conceded that reinforced concrete is the best fireproof material we can have, only while recognizing this fact we must not be blind to the danger of neglecting to ensure the durability of the work and that we fear is sometimes allowed to take place. It is only recently that attention was drawn to the undesirability and even danger of attempting to bond bricks and stone to old or set concrete for it was found out that these materials with new concrete would not adhere to concrete work of even a few hours previous. That we have now got a first class fireproof material of any required strength should not sanction its application without all the safeguards to which it is entitled.

Concerning the interminable controversy as to the preservation of concrete under ground the only conclusion is, that "there is much to be said on both sides." Ship builders and repairers who may be accepted as impartial and unprejudiced judges are agreed that 3 to 6 in. of very rich cement mortar on a steel vessel's inner plating will preserve the plates perfectly so long as the cement covering does not crack but if it gets damaged and acid water reaches the steel below the result is worse by far than if no concrete had been used. One of the best informed of these authorities says that he could take a brief from either side and would undertake that in the worst case his opponent should not defeat him, adding that from his own personal knowledge he could supply his clients with all the evidence they might require either for or against. For work underground which may at some time be exposed to the action of acid water it would be well to leave out steel rods altogether and make it entirely of stronger concrete. If a column is exposed to destructive acid action on steel at its base the value of the whole is affected, but if steel is only introduced above the danger zone the desired satisfactory results will be assured and no danger need be apprehended.

In all concrete work, reinforced or not, eternal vigilance is the price of safety.

The naval authorities have arranged for the practical test of wireless telegraphy on board the ships of the combined fleets in the southern waters. There will be a comparative trial of two systems on board the Illinois and Alabama. There will also be a trial of the De Forest system which is used in long distance communications between Pensacola, Guantanamo, Culebra, San Juan and Colon. It has also been proposed to conduct wireless chains, that is the stringing of vessels out in a long line to see at what distance communications may be obtained between the ships. This is a character of work which has been done recently by the British navy and it is believed that it can be advantageously tried in our own service. The practical application of work is in connection with naval scouting.

At the twenty-sixth annual meeting of the Engineers' club of Philadelphia Mr. Carl Hering, the retiring president, read an annual address which was devoted to an analysis of the progress of the club since its foundation with recommendations for the future. The following officers were elected: Silas G. Comfort, president; Joseph D. King, vice president; Walter Loring Webb, secretary; George T. Gwillian, treasurer; W. P. Dalett, John T. Loomis and Henry Quinby, directors.

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MAINTENANCE OF MACHINERY IN MERCHANT SHIPS

In the Marine Review of Jan. 5 the paper which Mr. Robert Haig, Lloyds' surveyor at Philadelphia, read before the annual meeting, was brought up to the point at which he began the discussion of forced draft. From that point on he stated:

"Forced draft.—Forced draft has certainly been a most valuable development in engineering, the proof of which need not be presented here; the main question arising in this paper being the effect that forced or accelerated draft has had upon the life and maintenance of boilers.

"The two systems to be found in merchant ships are Howden's forced draft and Ellis & Eaves induced draft each of which in competent hands is capable of working the boilers at a very high efficiency. The closed stokehold system has confined itself largely to warships and will not be considered here.

"The effect of forced draft upon some boilers has been very marked indeed, and the question is of far-reaching importance as to what is the best air pressure to be carried in the ash-pits. In some vessels one-half inch is considered sufficient, and is then really an assisted draft, while in others pressures up to about three inches are carried in the ash-pits. It would almost seem as if somewhere between those two extremes would be found the desirable mean, but after close observation I am firmly of opinion that in shell boilers at all events the pressure in the ash-pits should not exceed one inch of water at any time. I have examined many boilers where high air pressures have been in use, and the results have been always the same—buckled and cracked plating, stay nuts burned off, caulking started, and leaky tubes, whereas, when the air pressure was not allowed to exceed one inch the condition of the boilers was as good as those working under natural draft.

"The maintenance of boilers under the higher air pressures is altogether out of proportion to the extra work got out of them, with the further result that a continuance of these higher pressures will cut out not less than 30 per cent of the useful life of the boiler. The further objection to high air pressures, and it is a potent one, is that there can be no attempt at coal economy with excessive pressures, as experiments and trials without number have fully demonstrated. The temptation is keen, to use higher air pressure when making up time, when coal is bad, or in the endeavor to get a power out of the boilers that their size does not warrant.

"These remarks can be applied to water-tube boilers also, although their physical condition is not so seriously affected as the shell boiler; but experience will show that even there a moderate air pressure in point of maintenance and coal consumption will be found more than desirable.

"Oil fuel.—The maintenance of boilers working with oil fuel is, at the present time, of decided interest in view of the possible development in this direction. It is not proposed to deal with the question of oil as a fuel, but rather to consider its adaptability and its effect upon boilers. The use of oil fuel has been with a few exceptions confined to oil-carrying steamers, but there is not any structural reason to debar its use in ordinary cargo or passenger ships as the fuel can be carried in the double bottom and in tanks fitted in the usual coal bunker spaces. With proper precautions taken the risk of explosion is very remote, as the flash point of the fuel is usually not less than 150° F.

"When the fuel is carried in the double bottom a heavy layer of cement three inches thick, properly sectioned off to keep it in place, has proved to be a good insulator for the tank.

"The two systems most widely applied to burning oil fuel are compressed air or spraying by steam.

"The former requires a small air compressor, or other suitable means for obtaining the required pressure which is usually about one inch; the other method, spraying by steam, requires the installation of extra evaporators to make up the loss of water used in spraying the oil, which is found to be about 3 per cent of the total steam evaporated. With the compressed air a certain amount of steam is, of course, required to drive the air compressor, but there is no doubt that with the air heated to a high temperature this process will be found to show a high efficiency, especially in long voyages, as under oil fuel conditions the combustion and the steam are steady, which always means economy.

"The condition of the boilers after using oil fuel is found, when the necessary safeguards have been taken to protect the surfaces of the combustion chamber from direct impact with the flame, not to differ to any material extent from that of boilers burning coal.

"The combustion chamber backs and sides require to be protected with brickwork carried up above the level of the furnace crown, and in most cases the furnaces are bricked over also, and arrangements of brick arches erected in the furnace to baffle or break up the torch-shaped flame within the length of the furnace. When these conditions are properly carried out, the boilers show not the slightest sign of distress, but if the brickwork is allowed to come down it means that the flame strikes straight through into the chamber; the furnace does comparatively little work, intense heat is localized in the combustion chamber back and tube plates, causing serious distortion and leakage.

"I have examined boilers that were less than twelve months in use, where the combustion chambers were seriously damaged from neglect to keep the brickwork in good condition. The burning of oil fuel is supposed to be a simple operation, and so it is when we know how to do it.

"There is every reason why boilers should work well under oil fuel. The temperature of the gases of combustion varies but little; there is no opening of furnace doors, and cleaning fires; the men readily handle it intelligently, and the maintenance of boilers working under oil fuel should, in capable hands, be less than under coal conditions. The drawbacks at present to its wider use seems to be more commercial than mechanical.

"Superheating.—The interest now being taken in the question of superheat seems to indicate that we have arrived at another period in the cycle of development in engineering.

"When steam pressures ranged from 40-lb. to 80-lb. superheaters of many types were in general use, and were considered almost indispensable, and at these low pressures they certainly were of value; but with the advent of the triple and later the quadruple expansion engines, superheaters went out of use.

"The whole aim of engineers for some considerable time past has been to seek for the improved economy in higher steam pressures the quadruple following the triple when pressures rose above 180 lbs. per square inch, and later, in the case of the Inchdune and other ships for the same firm, the five-crank engine was developed with Scotch boilers working at a pressure of 267 lbs. per square inch.

IMPROVED ECONOMY IN HIGHER STEAM PRESSURES.

"Engineers are now convinced that if any further economy is to be reached by higher pressures, a very radical departure will require to be made from the present type of engine and boiler. The times would seem to be propitious for this change, as shadowed forth in the development of the steam turbine and the more general use of water-tube boilers, but even in the turbine it is recognized more fully than in the reciprocating engine that there are great possibilities for a higher efficiency and economy by the use of superheated steam. Dealing with the present reciprocating engine, it is

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well known that the moisture or water particles in the steam act as a lubricant for the leakage of the steam between the piston and the cylinder walls; this leakage being excessive in the case of many piston valves; and as piston valves by reason of their equilibrium under working conditions are now very widely used, it is recognized that with steam of an increased volume and more closely approaching a gas, leakage will be less likely to take place, and efficiency will be improved.

"It is not proposed in this paper to deal with the development of the steam turbine, but reference may be made to the fact that superheating can with perfect safety be carried to a much greater extent and with corresponding advantages in the turbine than would be possible in the reciprocating engine. In the turbine there are no surfaces, such as cylinder walls, valve faces, piston rods, etc., so that no limitations to the amount of superheating will be met with in the machine. In the reciprocating engine it will be very different, as there very high temperatures may readily cause abrasion of the surfaces; but it is not considered that from 100° F. to 150° F. of superheating will produce conditions that cannot easily be dealt with. It is in the multiple method of superheating wherein the greatest possibilities seem to lie; that is, in superheating the steam on its way from the boilers to the engine, and then after doing work in the cylinder it is passed through another heater, and so on to each succeeding cylinder, the steam being superheated at each change. This no doubt means a certain amount of complication, and perhaps weight, but as it must increase the efficiency of the steam quite considerably, the extra weight in superheaters, it is claimed, will be equalized by the reduced boiler weights required. If superheating be applied to the initial stages alone, a decided gain would result by getting rid of the water brought over by the steam from the boilers by priming or other causes, and would result in lessened leakages at the engine and get useful work out of a certain proportion of the steam that would otherwise, by condensation, become inert. Of course there are many objections to superheaters which are well known and need not be recapitulated here, but there is not the slightest doubt that with the renewed interest now being taken in this subject, superheaters of a widely different type from those of the past will be developed.

"There would, of course, be a certain percentage of drop in the pressure, due to the friction and wire-drawing through the passages and connections of the superheater, but with well designed apparatus this 'drop' should only be small, and would be more than compensated for in the higher quality of the steam.

"The whole question of superheat is likely to lead to considerable development in the early future if engineers are able to overcome the objections of the ship owners to what many consider only an added complication.

"Main and auxiliary steam pipes.—The necessity for a good pipe arrangement was never greater than at the present time. As stokeholds extend in length the demand for well designed main steam pipe lines is very urgent, so that the losses from drop in pressure between the boilers and engines should be kept as low as possible. As long lines of steam pipes have considerable movement when under steam, the greatest care should be taken to avoid any abrupt changes in the direction of the line of piping, and where it is found necessary to make changes, expansion joints should be fitted and so arranged that it will not be possible to subject the bends and other connections to any stress beyond that due to the boiler pressure. Main steam-pipe flanges should not be bolted to bulkheads unless expansion joints are in the immediate vicinity, and so arranged to take up any movement in the bulkhead that may take place; and never under any consideration when struts carried from any other part of the machinery are attached to the bulkhead in proximity to the steam pipes, as grave danger is to be apprehended in this arrangement in the event of the vessel grounding or meeting with other serious damage. Long lines of steam piping mean considerable condensation, and ample means should be taken to ensure this water being trapped, and where this is done automatically hand drains should also be fitted, so that in the event of any of the lines being laid off temporarily, the engineer will always be able to inform himself as to whether the pipes are clear of water before turning steam on.

"The arrangement of auxiliary steam lines in many cases leaves much to be desired; pipes are dropped down to low levels to get round some obstructions, then raised abruptly to higher levels, thus forming a pocket which is a lodgment for water, and besides being a positive danger, it lowers very materially the efficiency of the whole auxiliary outfit.

"I am perfectly familiar with the fact that all pipe arrangements are a compromise from beginning to end, the ship's structure and other considerations requiring to be dealt with at every step, but I am convinced that where careful attention is given to the detail of the whole arrangement much greater satisfaction will be obtained, and the wear and tear on the steam end of the auxiliaries will be correspondingly reduced. Few auxiliaries can lay claim to a very high steam efficiency, this being due in no small measure to the quality of steam with which they are operated.

"It is not possible to lay down any lines upon which a pipe arrangement should be designed, the exigencies of each case requiring special consideration, but the chief aim should be to avoid complications; the use of cast iron in any form should be forbidden, copper bends and expansion arrangements being fitted to accommodate the movement that takes place in the long stretches of auxiliary steam piping.

"Pumps.—One of the greatest advances made in the development of the present triple or quadruple engine has been in relieving the main engine of the duty of driving the pumps and using the power for propelling the ship only.

"The long stroke slow working simplex feed pumps now in use, when fitted with automatic speed regulators, give good results; the feed line is not subjected to shocks and as the pump only works when there is water to pump, it means that less air is forced into the boiler along with the water. As the water ends of high-class feed pumps are of brass, the valve seats should be cast solid with the chamber; removable seatings that are only 'driven in' should not be accepted, as they are sure to become loose unless they are well secured in place by screwed pins through the flanges into the chamber, and as these pumps require to pump water that is well over 200° F. against a high pressure, this class of pump requires to be of substantial make and the best workmanship; otherwise, they are a continual source of trouble.

"One other good feature of the independent feed pump, especially in large installations, is that they are usually fitted in pairs and interchangeable, which means that the breakdown of a feed pump is not so serious as formerly, and as most pumps of this class have considerable reserve capacity any mishap occurring to put a pump out of action does not effect the speed of the vessel.

"The whole array of auxiliary or independent machines, such as feed, bilge, ballast, air, circulating and sanitary pumps, electric light, blower and ventilating fan engines, etc., now usually fitted, are an elaboration of the idea of separate units for each particular service, and have in most cases been found to do their work remarkably well; but it has to be remembered that the maintenance of such a large number of steam users in even a moderate degree of efficiency, entails a large amount of work and expense, and as many of these auxiliaries are so placed that examination and repair are difficult to accomplish, it can be easily understood that they are neglected and become most uneconomical steam users. This feature of

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auxiliaries is perhaps not much considered, but investigation will disclose what a surprisingly large proportion of the boiler power is absorbed in driving the auxiliary machinery.

"Electric power in some cases has been made use of for driving quick moving auxiliary machinery, such as blower and ventilating fans, centrifugal pumps, etc., and that there is a wide field for electric power in this direction is undoubted, for although the first cost of the electric installation is greater, the up-keep and losses are much less. There is at present a certain amount of distrust in the minds of many engineers against electric motors taking the place of the steam engine when a positive action is demanded. That there is considerable force in this objection will be realized in the event of the motor attached to the circulating pump breaking down when leaving the dock, and bringing the engines up from lack of vacuum, and there is this further danger, that, as circulators are carried low down, an excess of water in the engine room might very easily put the motor out of action altogether. Notwithstanding the objections against the use of the motor, I firmly believe that their use will become general where continuous running is required, and if the motors are properly cared for and not overloaded, satisfactory results will be obtained. Cross-connections are always arranged for to provide against such contingencies as the breakdown of the circulator, but unless electricians can produce a motor, proof against the effects of oil and salt water, circulators should not be electrically equipped.

"Small steam turbines for which a fair economy is now claimed, seem well adapted for high speed continuous running, their action is positive, and the tear and wear is practically nil. The whole question of the adaptability and location of auxiliary machinery is now receiving very much better attention than hitherto, and rightly so, as a bad arrangement of this very important factor is a serious drawback; the upkeep is excessive, breakdowns are continuous, and are most harrassing to the whole engineering staff, as it means continual toil from port to port, and all from causes that experience might well have prevented.

"The question as to the best steam pressure, in point of economy and efficiency for operating auxiliaries, is of decided interest. It does seem an anomaly to raise steam up to the high pressure in use at present, about 210 lbs. and then wire-draw it through a reducing valve down to 100 lbs. to make use of it.

"Few auxiliaries are well adapted or kept in such mechanical efficiency to profitably use steam of the higher pressures, as the losses from radiation and condensation and other leakages are considerable, and as auxiliaries are not an afterthought, it would undoubtedly seem to be a better arrangement for a certain proportion of the boiler power to be designed for the lower pressure. The first cost would be decidedly less, as the price of boiler power and all the necessary fittings for the 100 lbs. steam pressure is very much lower than it would be for 210 lbs. Some vessels have been arranged along these lines and the results have been very satisfactory indeed.

GENERAL.

"There are many other points that might have been incorporated in this paper, such as feed heating, use of evaporators, filters, etc., etc., but enough has been dealt with to show that the efficient maintenance of machinery at the present day is a living complex reality, and demands from those who have to take up the responsibility a high order of intelligence and unremitting care.

"The later developments have unquestionably demonstrated that rule of thumb methods are no longer admissable, and where such valuable property is at stake the best in design, material, workmanship and supervision is demanded, and only the best should be accepted."

TRADE NOTES

The Atlantic Works, Inc., Philadelphia, Pa., has received an order from the American Car & Foundry Co. for one of their B-17 adjustable bevel band saw machines for use in the Jackson & Sharp plant at Wilmington, Del.

The Lane & DeGroot Co., Long Island City, manufacturers of boats, launches, etc., recently completed two large contracts which were in the nature of rush orders. One of them comprised eight cars of life boats and life rafts for the Fall River steamer Providence. The other included seventeen 28-ft. life boats, one 28-ft. life boat launch and six 20-ft. Barstow life rafts for the steamship Dakota. The company is now at work upon an order for eight 22-ft. wooden life boats for the Peninsular & Occidental Steamship Co.

The Fort Wayne Electric Works, Fort Wayne, Ind., have just put out bulletin No. 1,060 on the subject of portable wattmeter calibrators. The Type K portable wattmeter calibrator has been designed for use in calibrating meters without removing them from service and without expending more than a few minutes time in calibrating each meter. By its use one man can calibrate a large number of meters in a day without increasing the labor or equipment at the station. The Type K calibrator has been developed in two forms, one known as the ringing calibrator and the other as the registering calibrator.

The Carbolineum Wood Preserving Co., Milwaukee, Wis., has just put out a bulletin concerning their product. They say that Avenarius Carbolineum will prevent most efficiently the rot, dryrot and decay of woodwork in any situation and is guaranteed to double its life if properly used. It will prevent the checking and warping of woodwork and will expel and repel dampness from wood and make it waterproof. It will prevent crumbling of brick, stone walls and tiling and will make them waterproof and inpervious to dampness. It contains no carbolic acid, is antiseceptic and free from all porous ingredients. The substance is applied with a brush like paint or by immersion of timber. The company says anyone who buys a barrel of Avenarius Carbolineum will become convinced of its merits. The circular contains testimonials from the C. H. Starke Dredge & Dock Co., Milwaukee, Wis.; the C. Reiss Coal Co., Sheboygan, Wis.; and from various others including Mr. Benjamin Douglass, bridge engineer of the Michigan Central railroad, Detroit, Mich. The company says that the government is a constant buyer of Avenarius Carbolineum and that government engineers specify and use it regularly wherever a wood preserver is needed. Anyone interested in this subject would do well to write to the company for its interesting literature.

The H. W. Johns-Manville Co., New York, have just placed on the market two additions to their already very complete line of asbestos packings. These are known as Kearsarge spiral high pressure piston and valve rod packing, and international hot water pump packing. The Kearsarge spiral packing is an old friend in new guise. It is the Kearsarge asbestos and rubber wound cloth coil packing, so well and favorably known to the trade, put up in spiral form to meet the growing demand for that type of packing. It has proved its merits as an efficient and durable packing on piston and valve rods, against high pressure, high temperature, and high speed. The International is a specially prepared and treated packing for use on pumps handling water at high temperatures and on piston and valve rods of engines against wet steam. This material has been tested under actual working conditions for over a year and has been found to be satisfactory in every respect for the service mentioned. The manufacturers have prepared attractive literature descriptive of these two packings which they will be glad to send to anyone interested.

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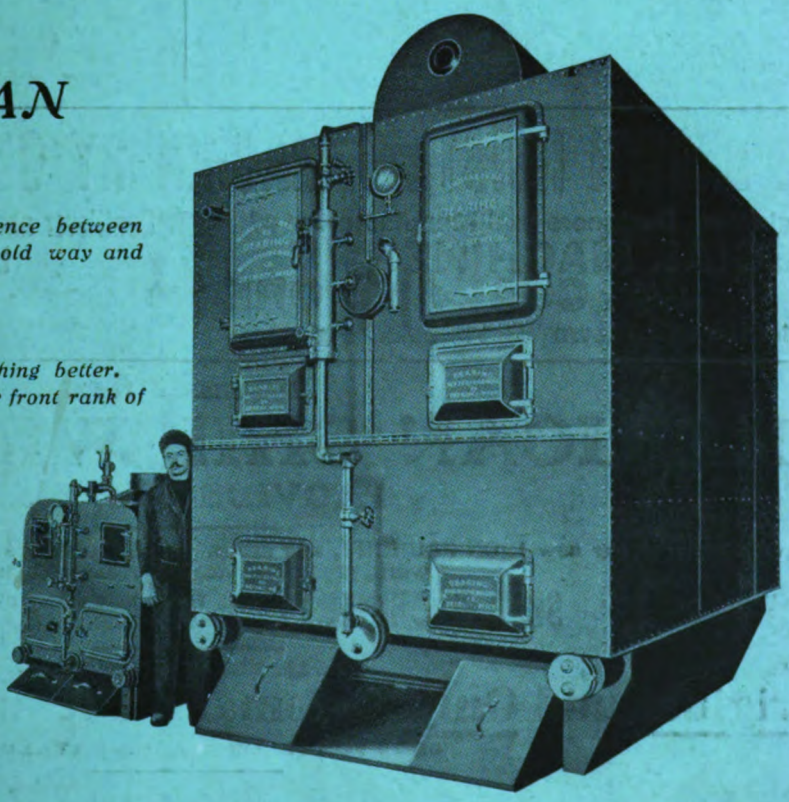

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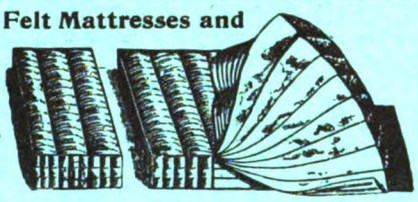

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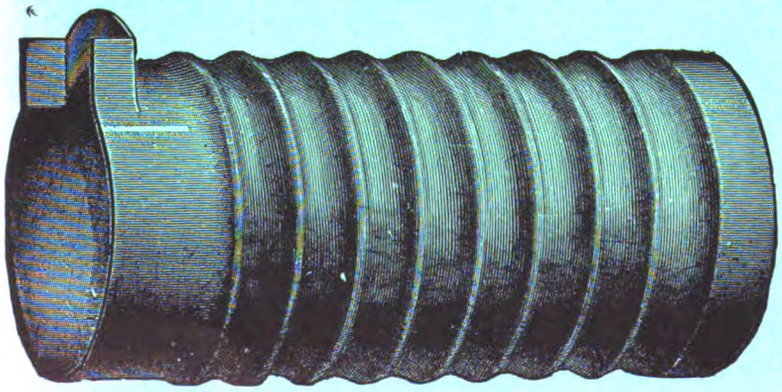

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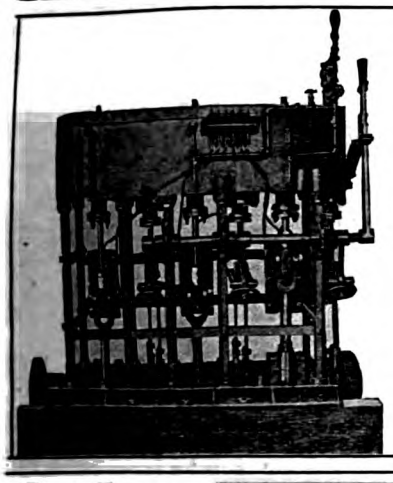

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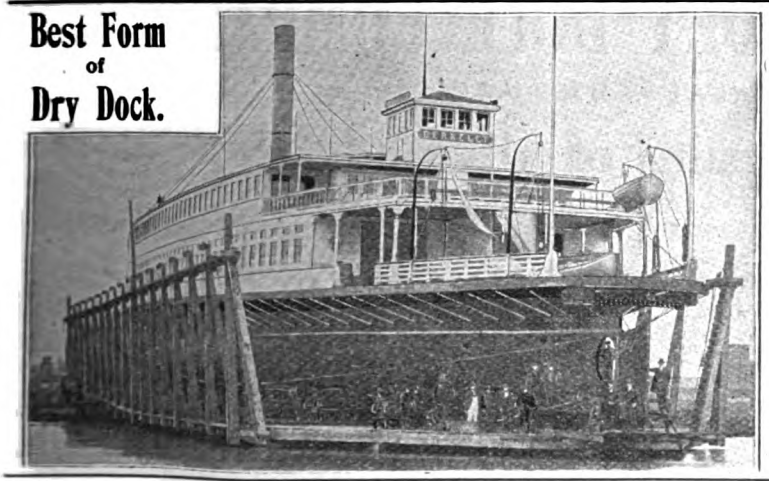

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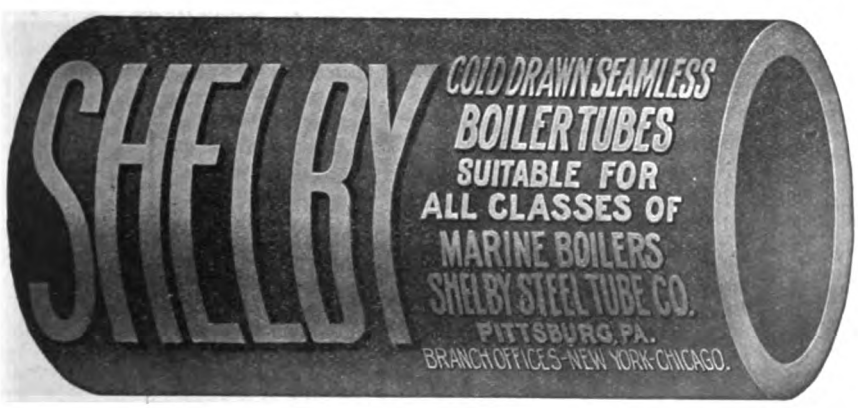

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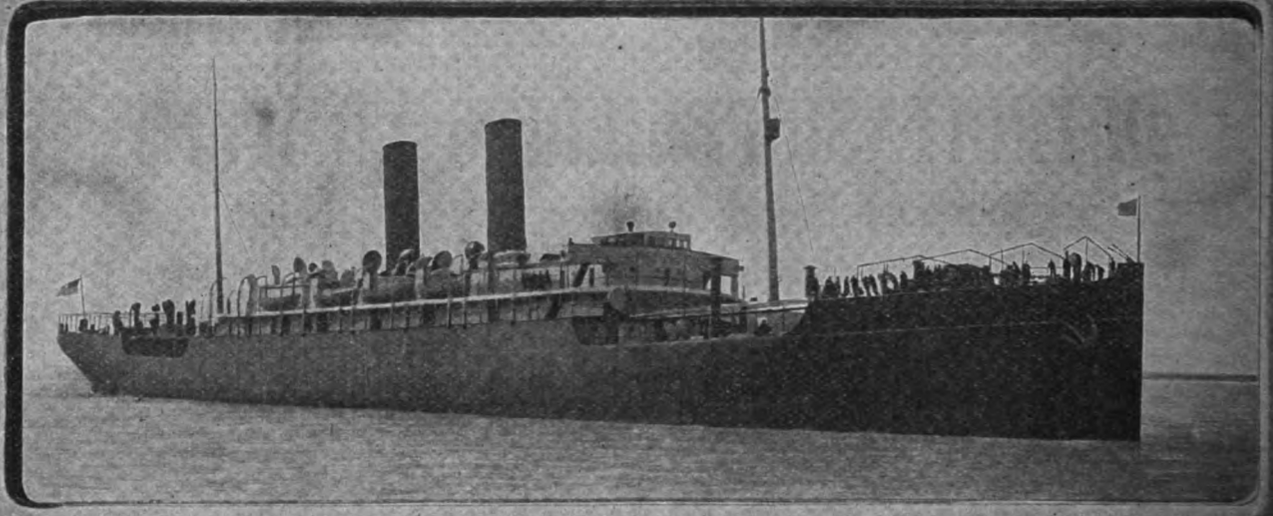

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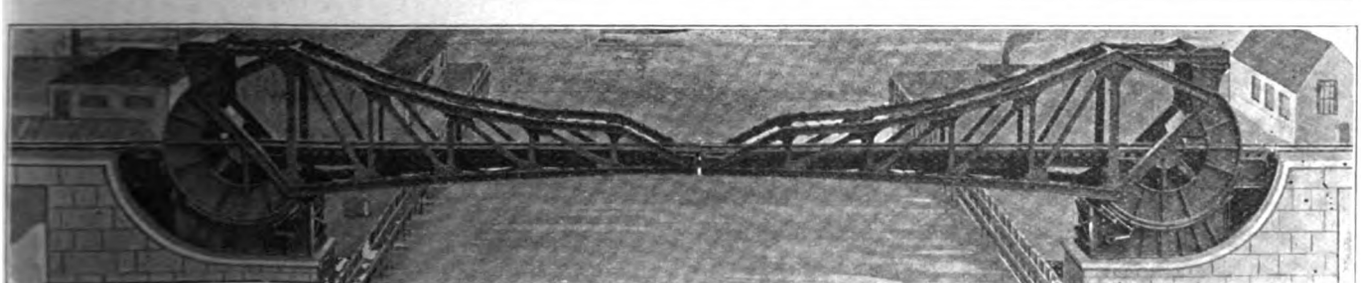

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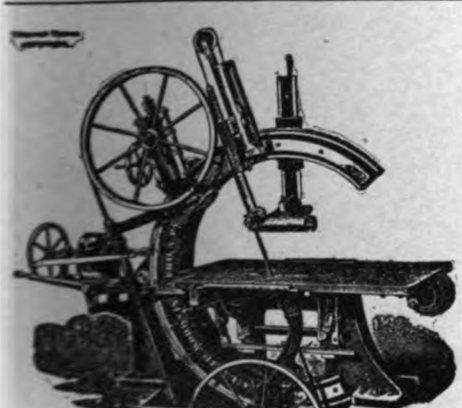

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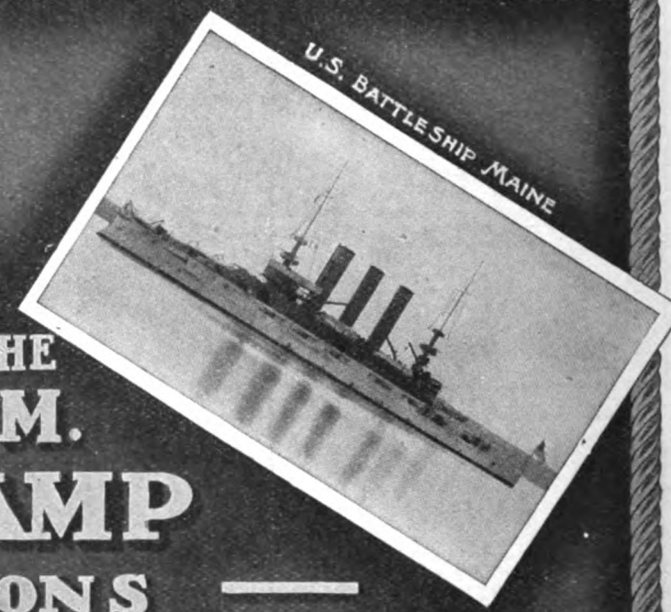

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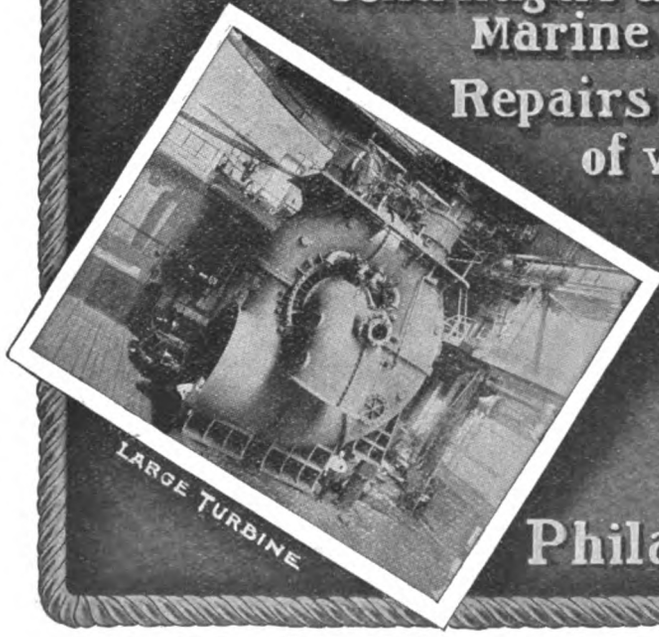

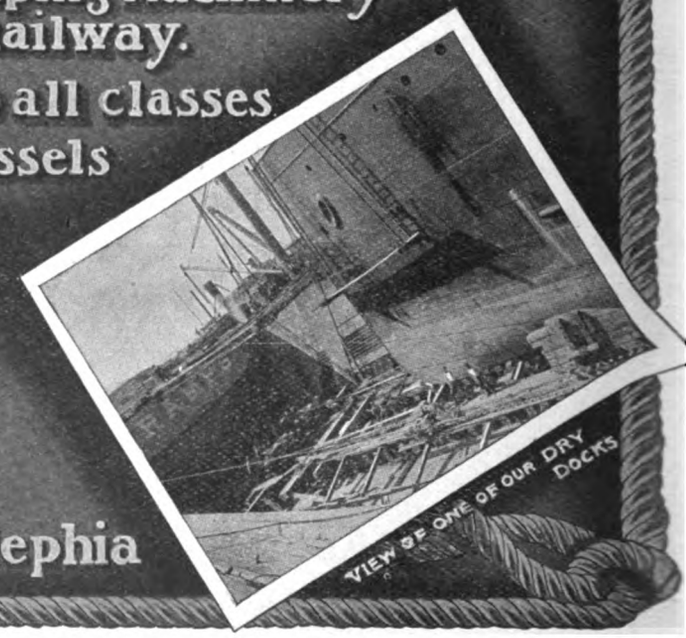

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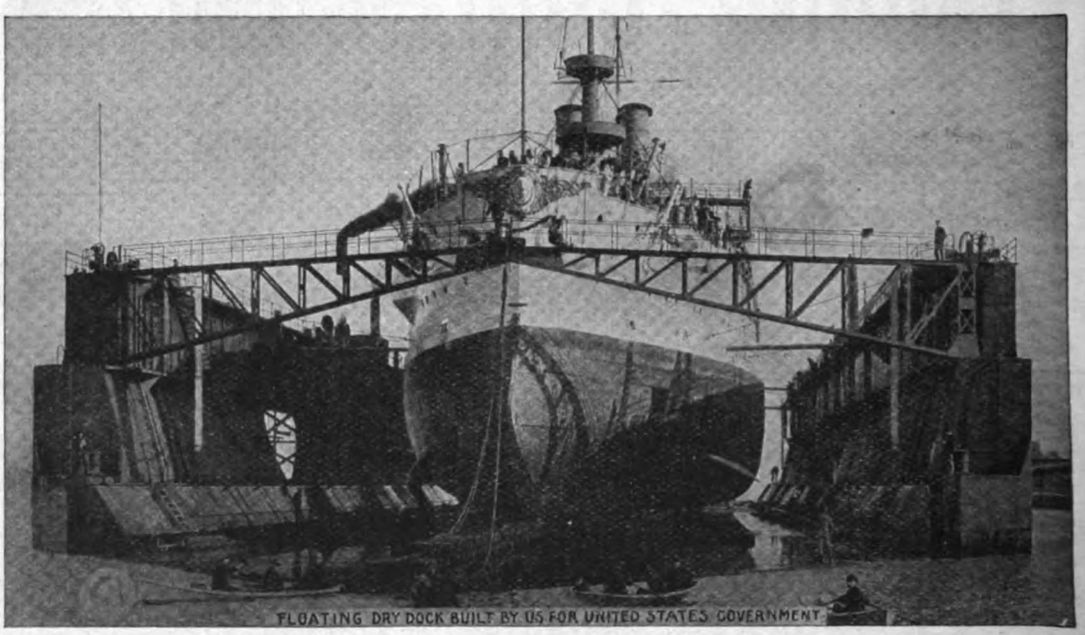

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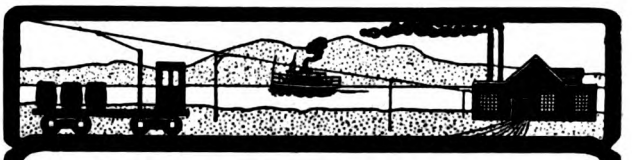

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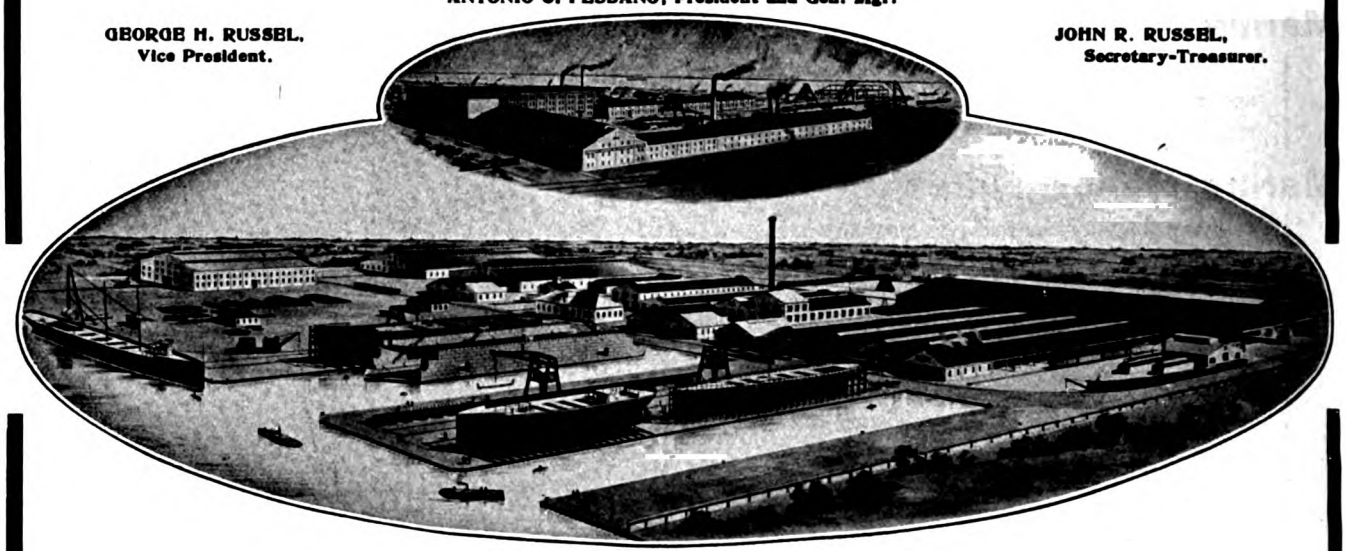

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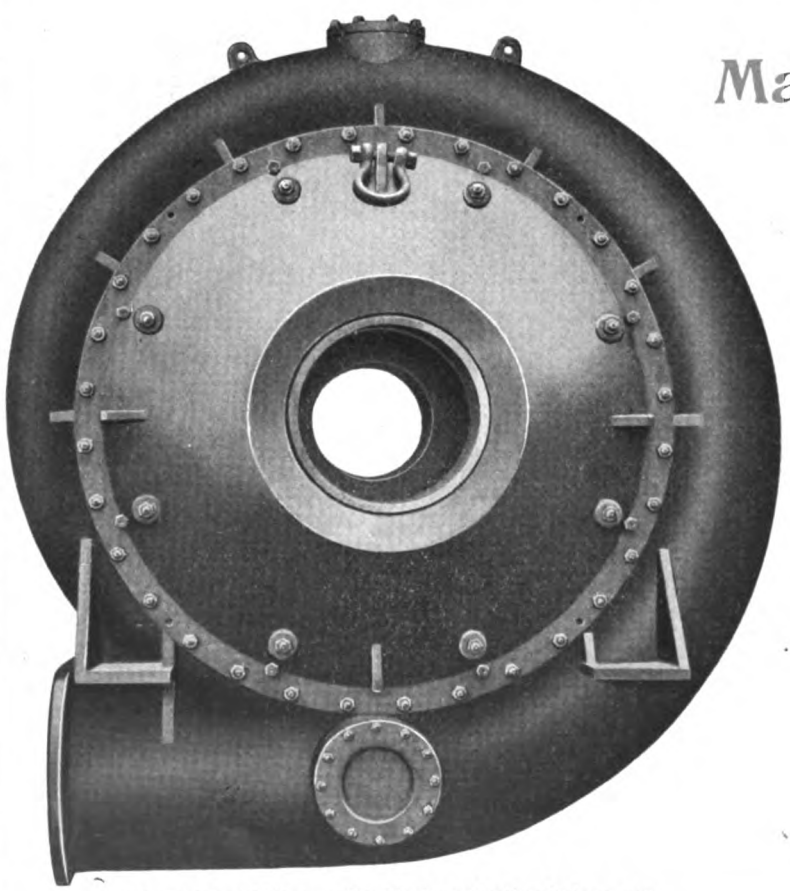

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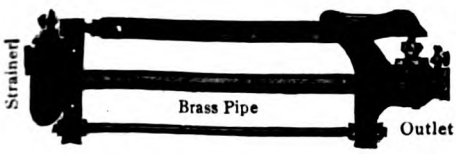

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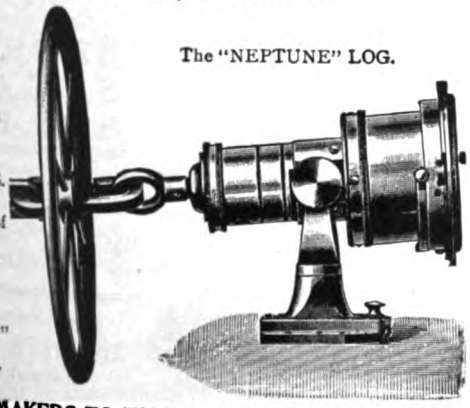

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PROPOSALS FOR DREDGE.—Mississippi River Commission, Fullerton Building, St. Louis, Mo., Jan. 16, 1905.—Sealed proposals, in triplicate, for construction and delivery of self-propelling hydraulic dredge and ponton pipe line will be received here until 12 noon, standard time, March 17, 1905, and then publicly opened. Information furnished on application. WM. B. LADUE, Capt., Eng'rs, Sec'y. Mar. 9

U. S. ENGINEER OFFICE, Jones Building, Detroit, Mich., January 16, 1905. Sealed proposals for dredging in lower Detroit River, will be received here until 2 p. m., standard time, February 16, 1905, and then publicly opened. Information furnished on application. CHAS. E. L. B. DAVIS, Lieut. Col., Eng'rs. Feb. 9

U. S. ENGINEER OFFICE, 1637 Indiana ave., Chicago, Ill., Jan. 4, 1905. Sealed proposals for dredging and constructing docks in Chicago river, Ill., will be received here until 12 noon, Feb. 4, 1905, and then publicly opened. Information on application. O. H. ERNST, Col., Engrs. Feb. 2

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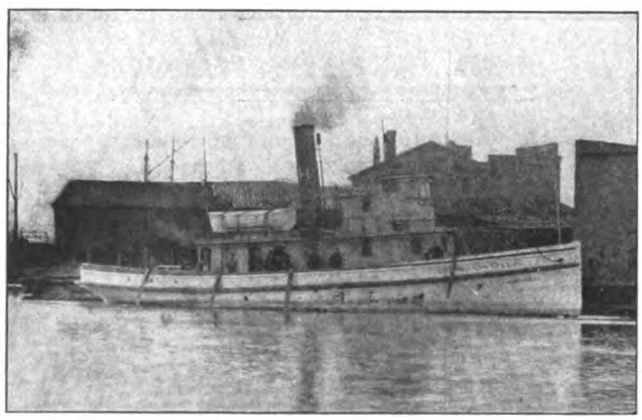

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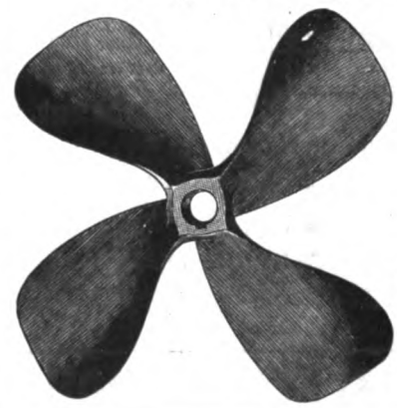

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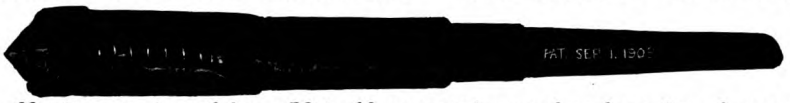

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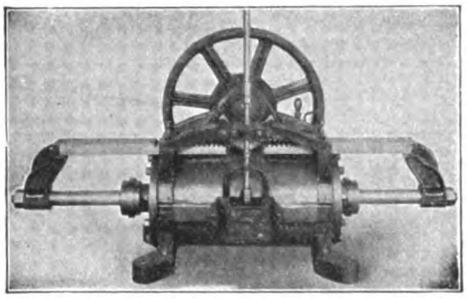

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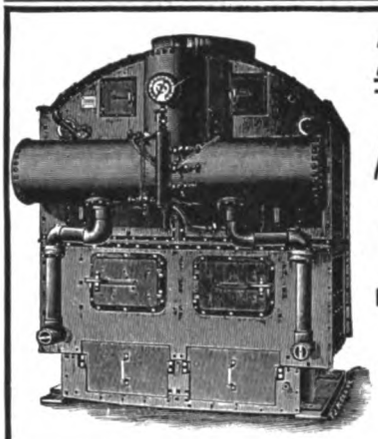

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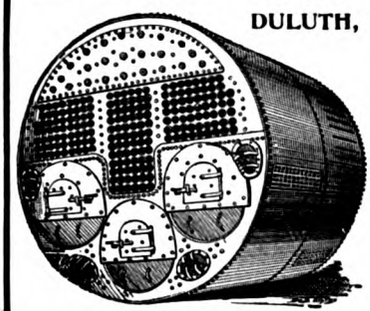

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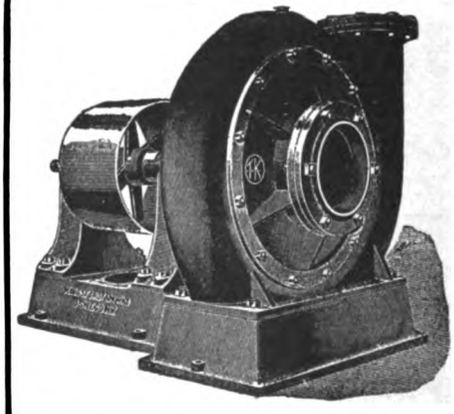

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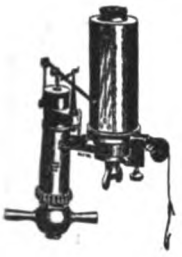

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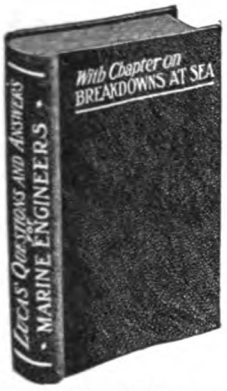

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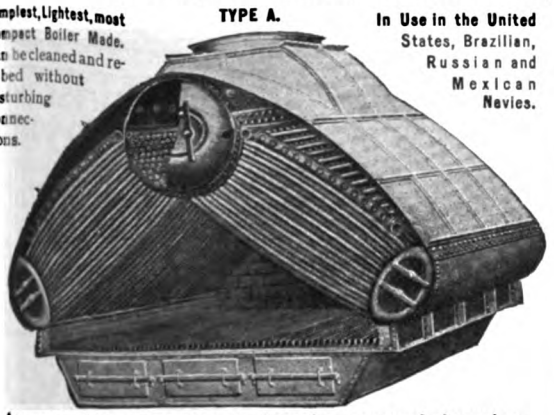

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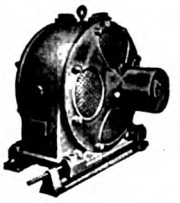

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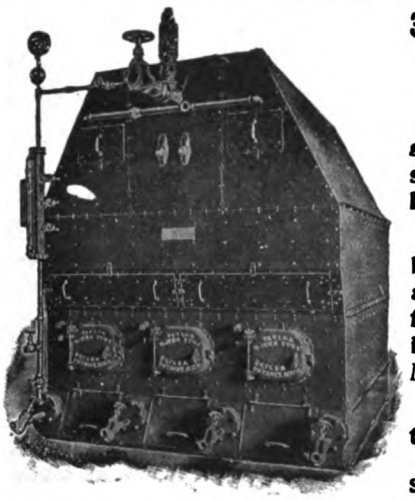

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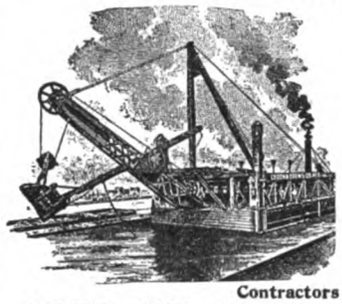

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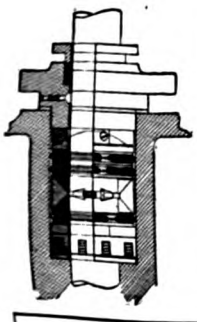

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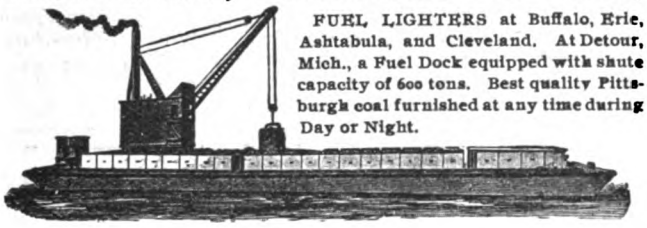

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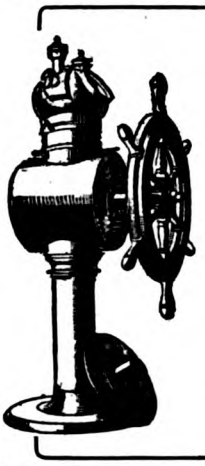

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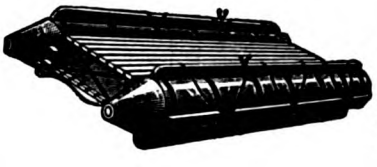

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Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co..... ..... Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.
Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works Detroit.
Marine Iron Works ....Chicago.
Kingsford Foundry & Machine Works.... ..... Oswego, N. Y.

REFRIGERATING APPARATUS.
Great Lakes Engineering Works.....Detroit.
Roelker, H. B. .....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.
Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping.. .....New York.

REPAIRS—ENGINE AND BOILER.
(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works..... .....Midland, Ont.

RIVETS, STEEL FOR SHIPS AND BOILERS.
Bourne-Fuller Co.....Cleveland, O.

SAFETY VALVES.
American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.
American Canvas & Tarpaulin Corp ....Buffalo.
Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.

SALVAGE COMPANIES.
See Wrecking Companies.

SCHOOLS—NAVIGATION.
Chicago Nautical School.....Chicago.

SEARCH LIGHTS.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co..... .....Pittsburg, Pa.

SHEARS.
See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.
Bourne Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

SHIP BUILDERS.
American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd.Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Roach's Ship Yard .....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
Willard, Chas. P. & Co.Winthrop Harbor, Ill.

SHIP CHANDLERS.
American Canvas & Tarpaulin Corp ....Buffalo.
Baker, Howard H. & Co.. .....Buffalo.
Marine Mfg. & Supply Co.....New York.
Upson-Walton Co.....Cleveland.

SHIP DESIGNERS.
Kidd, Joseph..... .....Duluth.
Kreer & Parsons.....Chicago.
Matteson & Drake.....Buffalo.
Rice & Lovejoy.....Buffalo.
Steel, Nacey & Hynd.....Cleveland.
Wood, W. J.....Chicago.

SHIP LANTERNS AND LAMPS.
Russell & Watson .....Buffalo.

SHIP TIMBER.
Martin-Barriss Co.....Cleveland.

SMOOTH-ON COMPOUND, FOR REPAIRS.
Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co..Cuyahoga Falls, O.
Reading Iron Co.....Reading, Pa.

STEAM VESSELS FOR SALE.
Gilchrist & Co., C. P. .....Cleveland.
Holmes, Samuel .....New York.
Lester, S. S.....Quebec, Can.
McCarthy, T. R.....Montreal, Can.

STEAMSHIP LINES, PASS. AND FREIGHT.
American Line .....New York.
Anchor Line .....Buffalo.
Boston Steamship Co.....Boston.
International Mercantile Marine Co..... ..... Philadelphia.
New York & Cuba Mail S. S. Co.....New York
Red Star Line .....New York.
United Fruit Co .....Boston.

STEEL CASTINGS.
Otis Steel Co.....Cleveland.

STEERING APPARATUS.
American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co....Port Huron, Mich.
Marine Mfg. & Supply Co.....New York.
Moulton Steering Engine Co.....New York.
Sheriffs Mfg. Co.....Milwaukee.

SUBMARINE DIVING APPARATUS.
Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.
Gaskin, Edward .....Buffalo.
Hynd, Alexander .....Cleveland.
Lovejoy, H. O.....Buffalo.
Matteson & Drake .....Philadelphia.
Parker Bros. Co., Ltd.....Detroit.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

TARPAULINS.
American Canvas & Tarpaulin Corp ....Buffalo.

TESTS OF MATERIALS.
Hunt, Robert W. & Co.....Chicago.
Lunkenheimer Co .....Cincinnati, O

TILING, INTERLOCKING RUBBER.
New York Belting & Packing Co...New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.
Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.
Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.
American Ship Windlass Co..Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.
Donnelly Salvage & Wrecking Co..... .....Kingston, Ont.

TRAPS, STEAM.
Kieley & Mueller .....New York.
Sturtevant Co., B. F., ...Hyde Park, Mass.

TRUCKS.
Boston & Lockport Block Co.....Boston.

TUBING, SEAMLESS.
Shelby Steel Tube Co.....Pittsburg, Pa.

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VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co. ..... Boston.
Crane Co. ..... Chicago.
Jenkins Bros. ..... New York.
Kieley & Mueller ..... New York.
Lunkenheimer Co. ..... Cincinnati.
Ross Valve Co. ..... Troy, N. Y.

VALVES FOR WATER AND GAS.

Lunkenheimer Co. ..... Cincinnati.
Ross Valve Co. ..... Troy, N. Y.

VARNISHES.

Detroit Varnish Co. ..... Detroit.
Detroit White Lead Works ..... Detroit.
New Jersey Zinc Co. ..... New York.
Also Ship Chandlers.

VENTILATING APPARATUS FOR SHIPS.

Sturtevant, B. F. Co. ..... Hyde Park, Mass.

VESSEL AND FREIGHT AGENTS.

Boland, John J. ..... Buffalo.
Brown & Co. ..... Buffalo.
Elphicke, C. W. & Co. ..... Chicago.
Fleming & Co., E. J. ..... Chicago.
Gilchrist & Co., C. P. ..... Cleveland.
Hall, John B ..... Buffalo.
Helm & Co., D. T. ..... Duluth.

VESSEL AND FREIGHT AGENTS—Con.

Hawgood & Co., W. A. ..... Cleveland.
Holmes, Samuel ..... New York.
Hutchinson & Co. ..... Cleveland.
Lester, S. S. ..... Quebec, Can.
McCarthy, T. R. ..... Montreal.
Mitchell & Co. ..... Cleveland.
Parker Bros. Co., Ltd. ..... Detroit.
Prindiville & Co. ..... Chicago.
Richardson, W. C. ..... Cleveland.
Sullivan, D. & Co. ..... Chicago.

WATER GAUGES.

Bonner & Co., Wm. T. ..... Boston
Lunkenheimer Co. ..... Cincinnati, O.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co. ..... Buffalo.
DeGrauw, Aymar & Co. ..... New York.
Upson-Walton Co. ..... Cleveland.

WHISTLES, STEAM.

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co. ..... Boston.
Lunkenheimer Co. ..... Cincinnati.

WINDLASSES.

American Ship Windlass Co. . Providence, R. I.
American Ship Building Co. ..... Cleveland.
Hyde Windlass Co. ..... Bath, Me.
Jenks Ship Building Co. ... Port Huron, Mich.
Marine Mfg. & Supply Co. ..... New York.

WINCHES.

American Ship Windlass Co. . Providence, R. I.
Georgian Bay Engineering Works. ..... Midland, Ont.
Hyde Windlass Co. ..... Bath, Me.

WOOD PRESERVING PAINT.

Carbolineum Wood Preserving Co. ... Milwaukee.

WOOD WORKING MACHINERY.

Atlantic Works, Inc. ..... Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co. ..... Kingston, Ont.
Parker Bros. Co., Ltd. ..... Detroit.

YACHT AND BOAT BUILDERS.

Bertram Engine Works Co., Ltd. . Toronto, Can.
Drein, Thos. & Son. ..... Wilmington, Del.
Georgian Bay Engineering Works. ..... Midland, Ont.
Truscott Boat Mfg. Co. ..... St. Joseph, Mich.
Willard, Chas. P. & Co Winthrop Harbor, Ill.

YAWLS.

Drein, Thos. & Son. ..... Wilmington, Del.

ALPHABETICAL INDEX OF ADVERTISERS IN THE MARINE REVIEW.

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on pages noted.
The dagger (†) indicates that advertisement appears once a month.

Almy Water Tube Boiler Co. 38
American Bureau of Shipping 40
American Canvas & Tarpaulin Corporation 41
American Injector Co. 3
American Line 41
American Ship Building Co. 5
American Ship Windlass Co 2
American Steam Gauge Co. 59
Anchor Line 35
Armstrong Cork Co 52
Ashton Valve Co. 35
Atlantic Works 37
*Atlantic Works, Inc 7

Babcock & Wilcox Co. 7
Baker, Howard H. & Co 52
*Bertram Engine Works Co., Ltd. 37
Blake, Geo. F., Mfg. Co. 37
Boland, J. J 44
*Bonner & Co., Wm. T 37
*Boston & Lockport Block Co ... 31
Boston Steamship Co. 41
Bourne-Fuller Co. 35
Bowers, L. M. & Co. 38
Brevmann & Bros., G. H 43
Brown Hoisting Machinery Co., Inc. 2
Buffalo Dredging Co 42
Buffalo Dry Dock Co 4

*Camden Anchor-Rockland Machine Co 12
Carbolineum Wood Preserving Co. 40
Chase Machine Co 11
Chicago & Great Lakes Dredge & Dock Co 42
Chicago Nautical School. 37
Chicago Ship Building Co. 4
Cleveland City Forge & Iron Co . 51
Continental Iron Works 2
Cory, Chas. & Son. 50
Cowing, John P 7
*Craig Ship Building Co. 5
Cramp, Wm. & Sons, S. & E. B. Co 8
*Crandall & Son, H. I. 3
Crane Co. 39-40

Dake Engine Co. 38
Detroit Drug & Chemical Wks. 11
DeGrauw, Aymar & Co 51
Detroit, Belleville & Co. 35
Delaware River Iron S. B. & E. Works 37
Detroit Ship Building Co. 5
Dixon Crucible Co., Joseph 50
Donnelly Salvage & Wrecking Co. 40
Drein, Thos. & Son 43
Dunbar & Sullivan Dredging Co. 42

Elphicke, C. W. & Co. 44

Falls Hollow Staybolt Co. 38
Fisher Electrical Works 36
Fitz-Simmons & Connell Co 42
Fix's Sons, S. 50
Fleming & Co., E. J 44
Fletcher Co., W. & A 37
Fogg, M. W. 2
Fore River Shipbuilding Co 37

General Electric Co. 52
*Georgian Bay Engineering Wks. 37
Gilchrist, Albert J 44
Gilchrist & Co., C. P. 44
Goulder, Holding & Masten 44
Great Lakes Engineering Works 14
Great Lakes Register. 40

Hall, John B. 44
Hanna & Co., M. A 43
Hawgood & Co., W. A 44
Helm & Co., D. T. 44
Hickler Bros. 42
Holmes, Samuel 44
Holzapfel's American Compositions Co 38
Hoyt, Dustin & Kelley. 44
Hunt & Co., Robert W 45
Hutchinson & Co. 44
Hyde Windlass Co. 52
Hynd, Alexander 45

International Mercantile Marine Co. 41

Jenkins Brothers 52
Jenks Ship Building Co 5

Kahnweiler's Sons, David 50
Katzenstein & Co., L. 43
Kidd, Joseph 45
*Kieley & Mueller. 35
Kingsford Foundry & Machine Works 38
Kreer & Parsons 45
Kremer, C. E 44

Lake Superior Contracting & Dredging Co. 42
Lebanon Chain Works. 51
LeMois Scientifique et Industrial 12
Lester, S. S. 48
Lockwood Mfg. Co 37
Lovejoy, H. O. 45
L. S. & M. S. Ry. 51
Lunkenheimer Co. 13

McCarthy, T. R. 44
McCurdy, Geo. L. 40
*McMyler Mfg. Co. 43
MacDonald, Ray G 44
Marine Iron Co., Bay City, Mich. 43
Marine Iron Works 3
*Marine Mfg. & Supply Co. 43
Martin-Barriss Co 39
Maryland Steel Co. 9
Matteson & Drake 36
Milwaukee Dry Dock Co. 4
Mitchell & Co. 44
Morse & Son, A. J. 50
Mosher Water-Tube Boiler Co. . 39
Motor Boat and Sportsman's Show 39
Moulton Steering Engine Co. 38

Nacey, James 45
New Jersey Zinc Co. 11
Newport News Ship Building & Dry Dock Co 6
New York & Cuba Mail S. S. Co. . 41
New York Shipbuilding Co 13
Northwestern Steam Boiler & Mfg Co. 38

Otis Steel Co 9

Parker Bros. Co. 44
Peck, Chas. E. & W. F 40
*Penberthy Injector Co. 5
Pickands, Mather & Co. 43
Pittsburg Coal Co. 9
Potter & Potter. 44
Potter, J. D. 38
Powell, Ambrose V 45
Prindiville & Co. 44

Reading Iron Co. 13
Record of American & Foreign Shipping. 40
Red Star Line. 41
†Reilly Repair and Supply Co., Jas 13
Reliance Mfg Co 43
Rice, Henry 45
Richardson, W. C 44
*Ritchie & Sons, E. S 39
Roberts Safety Water-Tube Boiler Co 11
Roelker, H. B 37
Ross Valve Co 50

Safety Car Heating & Lighting Co 7
Scherzer Rolling Lift Bridge Co 52
Schrader's Son, A 2
Shaw, Warren, Cady & Oakes. ... 44
*Shelby Steel Tube Co 5
Sheriffs Mfg. Co. 36
Shipowners' Dry Dock Co. 37
Shipping World 51
*Smith & Son, Abram 43
Smith Co., L. P. & J. A 42
Smith Coal & Dock Co., Stanley B 9
Smith, Stanley B., & Co 9
Smooth-On Mfg. Co. 38
*Standard Oil Co 51
Starke Dredge & Dock Co., C. H. 42
Stirling Co. 9
Stratford Oakum Co., Geo 2
Sturtevant, B. F. Co 52
Sullivan, M 43
Sullivan & Co. 44
Superior Ship Building Co. 4

Taylor Water-Tube Boiler Co. ... 39
Thropp, J. E. & Sons Co. 50
Trout, H. G 36
Truscott Boat Mfg Co 50

United Fruit Co. 41
Upson-Walton Co. 52

Victor Metals Co 2

Walker, Thomas & Son. 35
Ward Line 41
*Watson-Stillman Co 51
Westinghouse Electric & Mfg. Co 39
White, Johnson, McCaslin & Cannon 44
*Willard, Chas. P. & Co 43
Wood, W. J. 45
*Woodhouse Chain Works 3

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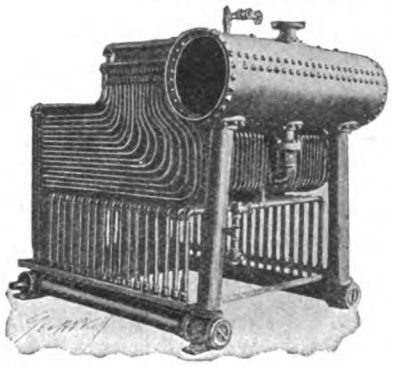

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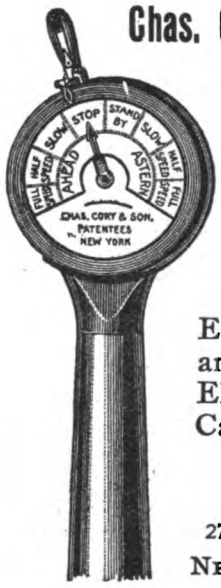

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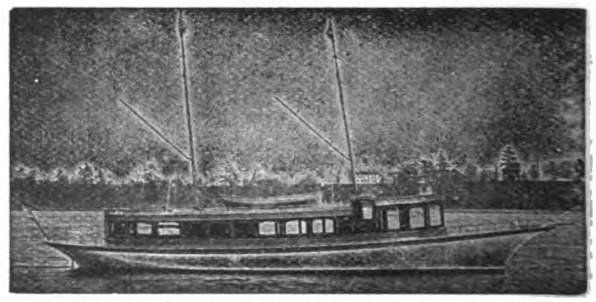

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No. 28, New York and Boston Exp.	*7:40 a.m.	*8:00 a.m.
No. 40, Toledo and Buffalo Accom	†10:00 a.m.	†10:30 a.m.
No. 32, Fast Mail	*11:25 a.m.	*11:30 a.m.
No. 48, Accommodation via Sandusky	†1:40 p.m.	.....
No. 42, Boston-New York Express	.....	*11:45 a.m.
No. 44, Cleveland and New York Spl.	.....	*3:00 p.m.
No. 46, Southwestern Express	.....	*3:10 p.m.
No. 116, Ashtabula Accommodation	.....	†4:30 p.m.
No. 6, Limited Fast Mail	*5:40 p.m.	*5:45 p.m.
No. 26, 20th Century Limited	*7:40 p.m.	*7:43 p.m.
No. 10, Chicago, N.Y. & Boston Spl.	*7:30 p.m.	*7:50 p.m.
No. 16, New England Express	*10:30 p.m.	*10:35 p.m.
No. 2, Day Express	†9:10 p.m.	†9:25 p.m.
No. 126, Norwalk Accommodation	†7:55 a.m.	.....

Westward	Arrive from East	Depart West
No. 7, Exposition Limited	*12:50 a.m.	.....
No. 11, Southwestern Limited	*2:55 a.m.	.....
No. 9, Day Express	.....	†6:00 a m.
No. 15, Boston and Chicago Special	*3:10 a.m.	*3:15 a.m.
No. 19, Lake Shore Limited	*7:15 a.m.	*7:25 a.m.
No. 23, Western Express	*10:30 a.m.	*10:35 a.m.
No. 29, Southwestern Special	‡11:10 a.m.	.....
No. 33, Southwestern Express	*12:25 p.m.	.....
No. 133, Cleveland and Detroit Exp.	.....	*12:45 p.m.
No. 47, Accommodation	†11:00 a.m.	†3:00 p m.
No. 141, Sandusky Accommodation	.....	†3:10 p.m.
No. 43, Fast Mail	*4:35 p.m.	*4:40 p.m.
No. 127, Norwalk Accommodation	.....	†5:10 p.m.
No. 37, Pacific Express	*6:50 p.m.	*7:20 p m.
No. 3, Fast Mail Limited	*10.50 p.m.	*10:55 p.m.
No 115, Ashtabula Accommodation	*8.30 a.m.	.....

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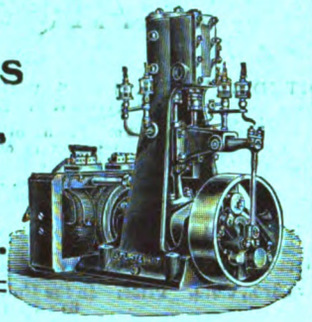

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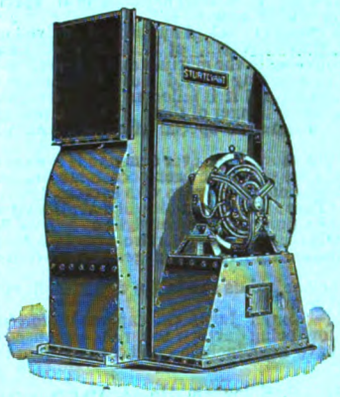

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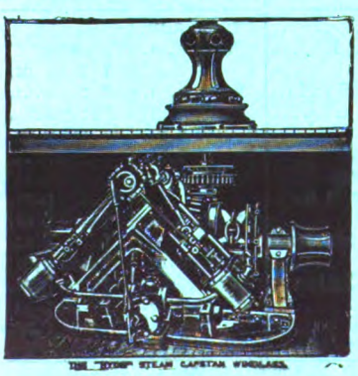

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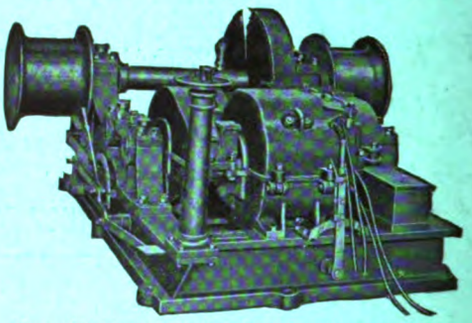

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